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THE COLEOPTERA
OF
THE BRITISH ISLANDS.



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THE
COLEOPTERA
OF
THE BRITISH ISLANDS.

*A DESCRIPTIVE ACCOUNT OF THE FAMILIES, GENERA, AND
SPECIES INDIGENOUS TO GREAT BRITAIN AND IRELAND,
WITH NOTES AS TO LOCALITIES, HABITATS, ETC.*

BY THE
REV. CANON FOWLER, M.A., F.L.S.

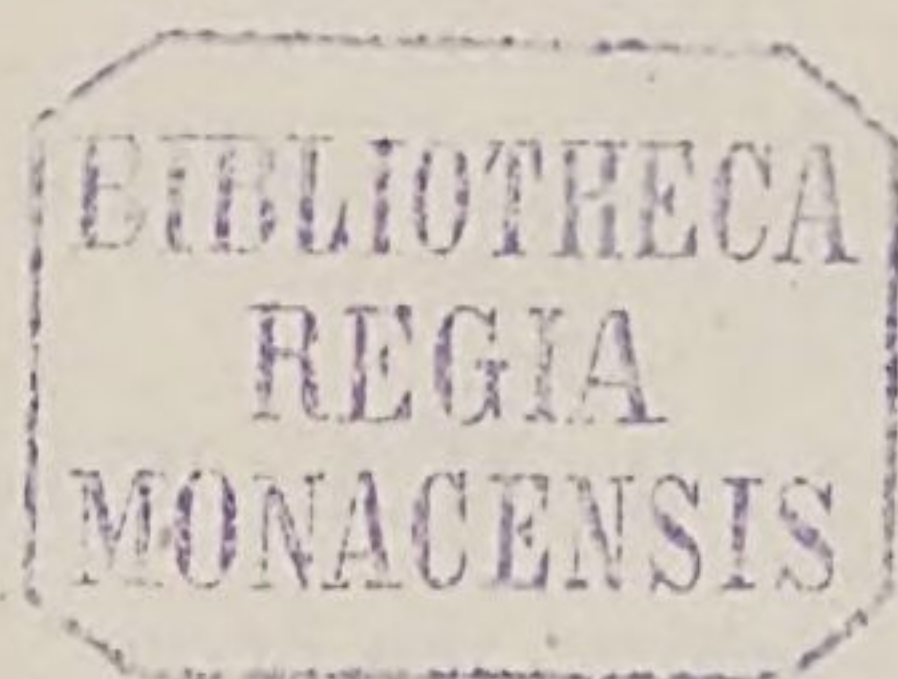
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THE "ENTOMOLOGIST'S MONTHLY MAGAZINE."

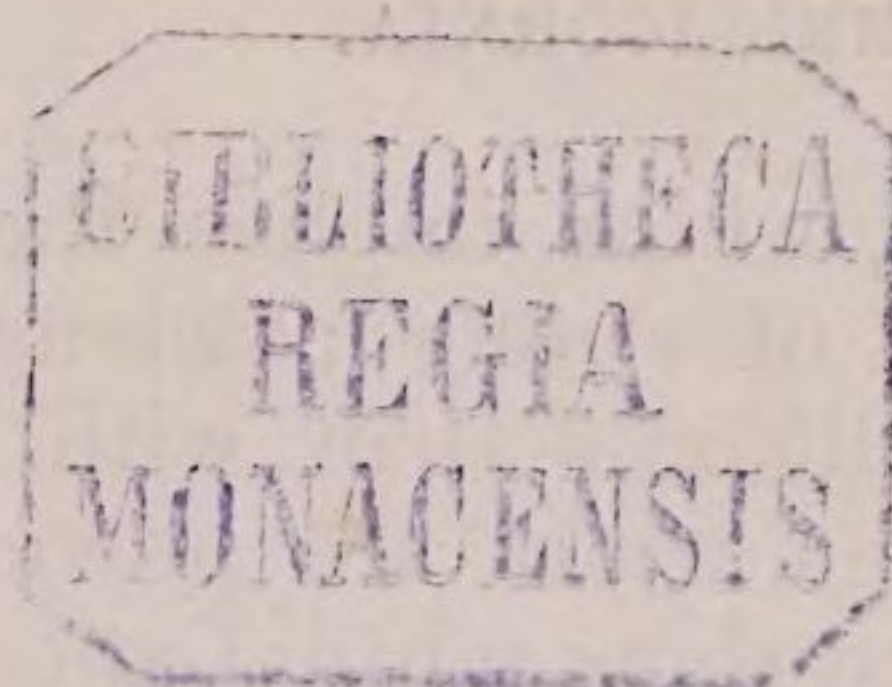
VOL. IV.

LAMELLICORNIA—SERRICORNIA—LONGICORNIA—PHYTOPHAGA.



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1890.





COLEOPTERA.

LAMELLICORNIA.

THIS is perhaps the most sharply defined of all the large series into which the Coleoptera have, for convenience sake, been divided: it contains two strongly-marked families, the Lucanidæ and Scarabæidæ, which are distinguished by having the antennæ terminated by a distinct and usually large club, which is composed of from three to seven lamellæ or plates: these in the Lucanidæ are immoveable, and the club is pectinate, but in the Scarabæidæ they are in some cases capable of being shut closely together or opened like the leaves of a book, while in others they are received into the first joint which is hollowed. The chief peculiarity, however, that strikes the ordinary observer with regard to the Lamellicornia generally is the immense development of the mandibles in many of the species, and more especially the great horns that arise from the head, thorax, and clypeus of the males: the use for which these horns are destined has given rise to much discussion. Mr. Darwin ("Descent of Man," page 297) says "that the extraordinary size of the horns, and their widely different structure in closely-allied forms, indicate that they have been formed for some purpose; but their excessive variability in the males of the same species leads to the inference that this purpose cannot be of a definite nature. The horns do not show marks of friction, as if used for any ordinary work. Some authors suppose that as the males wander about much more than the females, they require horns as a defence against their enemies; but as the horns are often blunt, they do not seem well adapted for defence. The most obvious conjecture is that they are used by the males for fighting together; but the males have never been observed to fight; nor could Mr. Bates, after a careful examination of numerous species, find any sufficient evidence, in their mutilated or broken condition, of their having been thus used;" the latter remark, of course, applies only to the species with largely developed horns, as those in which the mandibles are much developed (e.g. *Lucanus*) fight very fiercely; Mr. Darwin comes finally to the conclusion, that the horns have been acquired as ornaments, and that this hypothesis agrees best with the fact of their having been so immensely and yet not fixedly developed, and concludes his remarks on the group

as follows :—" Sexual selection, which implies the possession of considerable perceptive powers and of strong passions, seems to have been more effective with the Lamellicorns than with any other family of beetles. With some species the males are provided with weapons for fighting ; some live in pairs, and show mutual affection ; many have the power of stridulating when excited ; many are furnished with the most extraordinary horns, apparently for the sake of ornament ; and some, which are diurnal in their habits, are gorgeously coloured. Lastly, several of the largest beetles in the world belong to this family, which was placed by Linnæus and Fabricius at the head of the order." It does not, however, appear to be proved that any insects select their mates from any regard to personal appearance ; in fact, in the case of the Lepidoptera the female evidently exercises no choice in the matter as far as has at present been observed, and until it be proved that insects act in this matter as mammalia and birds undoubtedly do, the hypothesis of the horns of the Lamellicornia being ornaments gradually developing from sexual selection does not seem to be a sound one ; at present, however, their use has not been explained.

This series of Coleoptera, as above mentioned, includes most of the largest beetles in the world, notably the great Goliath beetles, and others which nearly equal them in size ; several authors have proposed to place them at the head of the whole order, partly on the ground of their size and development, and partly, in some cases, because of their internal structure ; the question, however, requires very careful consideration, and in the present state of our knowledge it is far better not to disturb the existing arrangement.

The larvæ of the Lamellicornia are thick and fleshy ; the head is corneous and rounded, without ocelli ; the maxillæ are composed of two lobes, which are either free or connate ; the antennæ are inserted at the sides of the head on a projection which looks like a first joint ; the joints vary in number from three to five ; the thoracic segments are of about the same length as the abdominal segments, and do not differ from them much in character ; the latter are nine in number, occasionally ten ; the anal segment is as broad as the preceding, and is in many cases divided in the middle by a transverse furrow, so that it appears as if divided into two joints ; in the greater number of species the abdominal segments from the first to the seventh are divided into three raised folds or " bourrelets," which unite at the sides in a triangular tubercle bearing one of the stigmata ; of these latter there are nine pairs in all, the first situated on the sides of the prothorax, and the eight others on the first eight abdominal segments, all on each side lying in the same horizontal line ; the legs are rather long, with the tarsi very small or completely wanting, in which case the tibiæ bear a minute claw at apex, which, however, is often absent at least on the posterior legs ; the apex of the body is curved, so that the insect is not capable of walking on a flat surface ; these larvæ feed on vegetable substances and dung, but occasionally on animal matter ; those that live in wood or at the roots of plants and grass take three years or more to come to maturity, whereas the coprophagous species go through their metamorphoses in a very short time (*v. Chapuis et Candèze, Cat. des Larves des Coléoptères, p. 112—115*)

Erichson divides the larvæ of the series as follows:—

- I. Lobes of maxillæ connate. (Pleurosticti.)
 - i. Mandibles obtusely dentate at apex, and furnished with transverse striæ on their posterior surface.
 - 1. Ninth segment of abdomen divided in middle by a furrow, which makes the segment appear as if divided into two (DYNASTIDES.)
 - 2. Ninth abdominal segment simple CETONIDES.
 - ii. Mandibles furnished with a smooth tooth at apex, posterior surface not furrowed; ninth abdominal segment as in the *Dynastides* MELOLONTHIDES.
- II. Lobes of maxillæ separate. (Laparosticti.)

The Laparosticti are further divided as follows by Chapuis and Candèze, following M. De Haan and others:—

- i. Segments divided into transverse folds.
 - 1. Antennæ composed of four or five joints.
 - A. Mandibles furnished with numerous teeth GEOTRUPIDES.
 - B. Mandibles bidentate or tridentate.
 - a. Mandibles distinctly tridentate COPRIDES.
 - b. Mandibles obtusely tridentate APHODIIDES.
 - 2. Antennæ composed of three joints TROGIDES.
- ii. Segments simple, without transverse folds.
 - 1. Antennæ composed of three joints; posterior legs very small (PASSALIDES.)
 - 2. Antennæ composed of four joints; legs strongly developed LUCANIDES.

The Lamellicorns are very poorly represented in Britain, although some of the species, such as the Stag-beetle, the Rose-beetle, and the Cockchafer, are among our largest and most familiar species, as also are the large species of *Geotrupes*, better known as the Dor- or Shardborne-beetle.

The two great families of the series may be divided as follows:—

- I. Club of antennæ subpectinate with the lamellæ not capable of being placed closely together LUCANIDÆ.
- II. Club of antennæ with the lamellæ capable of being placed close together and forming a compact club SCARABÆIDÆ.

LUCANIDÆ.

This family, which corresponds to the group Priocera of Dumeril, may be divided into two great divisions, the Lucanini and the Passalini, which are chiefly distinguished by the shape of the mentum and ligula; as, however, none of the Passalini are represented in the European fauna, we need not here consider them; the family Lucanidæ, in its widest sense, according to the Munich catalogue, contains seventy-two genera and five hundred and twenty-nine species; the genera, however, of the Passalini, which in this catalogue number only twenty-seven, have been since raised to sixty, and considerable additions have also been made to the Lucanini.

The Lucanidæ are chiefly found in tropical countries; only six genera containing fourteen species occur in Europe, of which three genera, each

represented by one species, are found in Britain; they are, as a rule, very conspicuous insects, and are chiefly remarkable for the great development of the mandibles in the male; in spite, however, of their formidable appearance, the mandibles of the male are not as strong or as capable of inflicting a severe wound as the short and comparatively insignificant-looking mandibles of the female. The following are the chief characteristics of the family:—Antennæ with a pectinate club, usually geniculate, 10-jointed; labrum nearly always connate with the clypeus; mandibles often much developed; maxillæ with two lobes; anterior coxal cavities closed behind; mesosternum short, metasternum large, epimera of mesosternum reaching the coxæ; elytra rounded at apex, covering abdomen; abdomen composed of five, rarely six, free segments; tarsi 5-jointed, the last joint very long.

The insects belonging to this family are almost entirely wood-feeders, but occasionally appear to be carnivorous; Professor Westwood (Classification, i. 157) refers to two cases, in one of which a *Lucanus* was observed descending a tree with a caterpillar in its jaws, and in the other a specimen of *Dorcus parallelipedus* was found in the act of biting a *Helops caraboides* for the purpose of sucking its fluid.

The larva of *Lucanus cervus* has been described by several writers; it is white with ferruginous head, nearly cylindrical, and of a soft fleshy consistence; the segments are not raised in three folds as in so many of the larvæ of the Scarabæidæ; the antennæ are short, and the legs moderate; the last segment of the abdomen is not so large as the preceding; with the help of its powerful mandibles it gnaws its way through the wood upon which it feeds; when full fed it forms a kind of cocoon out of the minute chips or dust which it has gnawed, and in this undergoes its transformation to the pupa and the perfect insect, the large horns in the former being folded upon the breast and ventral face of the abdomen; the larva does not appear to come to maturity for several (some authors say as many as six) years; occasionally it does considerable damage by gnawing into the roots as well as into the solid wood (v. Westwood, l.c. i. 188).

The three British genera of the Lucanidæ may be distinguished as follows:—

- | | |
|---|-----------------|
| I. Eyes more or less divided; ligula and maxillæ covered by the mentum; antennæ geniculate; posterior femora extending beyond margin of elytra. | |
| i. Eyes divided for scarcely half their diameter | LUCANUS, L. |
| ii. Eyes divided for nearly the whole of their diameter | DORCUS, McLeay. |
| II. Eyes entire; ligula and maxillæ not covered by mentum; antennæ straight; posterior femora not extending beyond margin of elytra | SINODENDRON, F. |

LUCANUS, Linné.

This genus contains about twenty species, four of which are found in Europe, and the rest occur in North America, India, China, Japan, &c.; our single species is the largest member of the Coleoptera that is found in Britain.

L. cervus, L. Black or pitchy black with the elytra lighter or darker castaneous, usually darker in the females than in the males; antennæ strongly geniculate with 4-jointed pectinate club; scutellum punctured at base with traces of a raised line; legs long, anterior tibiæ more or less strongly toothed externally. In the larger males the head is much broader than the thorax, and sometimes quite as broad as the elytra; the mandibles are strongly developed, and are sometimes very large; they are furcate at apex, and furnished with a large tooth in the middle; in the smaller males (*L. dorcas*, F.) the head is about as broad as the thorax, and the mandibles are toothed before middle; the head and thorax in the male are finely pubescent, dull, and rugosely punctured, and the latter is very transverse and not convex, with the sides angled behind middle; in the female the head and thorax are without pubescence, the head is much narrower than thorax, strongly and rugosely punctured, and the thorax shiny, ample, and convex, finely but distinctly punctured on disc and rugosely at sides; in both sexes the thorax shows a trace of a longitudinal raised central line; the mandibles are very short but very strong in the female, and the legs are much shorter and stouter than in the male; the elytra are more finely punctured and duller in the male than in the female. L. 20–50 mm.

On palings, &c., and very often captured on the wing towards evening; generally distributed and common throughout Kent and Surrey, and not uncommon in other southern counties; Arndel; New Forest; Southampton; Havant; Devon; it also occurs in Essex, Berks, Suffolk, &c.; it is rare in the Midlands, but has been recorded by Mr. Blatch from Bewdley, and by Mr. Garneys from Calke near Derby; it does not, however, occur further north; Dillwyn says that he has found it cast up upon the shore at Swansea, and adds, “as it has a Welsh name, ‘Huil Cornoc,’ it might be supposed to be frequent, but with this exception I have never found it in the principality.”

DORCUS, McLeay.

This genus contains about fifty species, which are widely distributed representatives occurring in North America, India, China, Japan, the Malay Archipelago, &c.; four are found in Europe, of which one only occurs in Britain; the larva does not differ materially from those of other allied genera; it appears chiefly to attack ash, elm, and willow trees.

D. parallelopipedus, L. Oblong, subparallel, dull black, rather depressed, more shining in female than in male; elytra closely and rugosely punctured; male with the head and thorax very dull, the former as broad as the latter, labrum broad and short, truncate; mandibles larger, with a very large and obtuse tooth in middle; head and thorax very finely and diffusely punctured and shagreened between the punctures; intermediate and posterior tibiæ with a spinose tooth on their external side behind middle; female with the head narrower than the thorax, and the mandibles much less strong, with feeble central tooth; head and thorax rather shiny, the former thickly and rugosely punctured in front with two tubercles about middle, the latter not punctured very closely

or distinctly on disc, somewhat rugosely at sides; elytra a little more strongly punctured than in male, and the external spine on tibiae more pronounced. L. 15–20 mm.

In rotten wood of ash, elm, &c.; often found on palings and sometimes in cellars and stables; London district, rather common and generally distributed; Kent; Glanvilles Wootton; New Forest; Devon; Swansea; Bath; Gloucester; Bewdley; Birmingham district; Shrewsbury; Repton; Sherwood Forest; Lincoln; Church Stretton, Cheshire; it appears to cease further north in England, and has not occurred in Scotland; it may, however, be regarded as of general occurrence from the Midlands southwards; one specimen has occurred at Armagh in Ireland (Rev. W. F. Johnson).

SINODENDRON, Fabricius.

This genus contains three or four species, one from Europe and the others from North America; they are by Thomson and others raised to the position of a distinct family, Sinodendridæ; they are easily distinguished from the members of the two preceding genera by having the eyes entire, the posterior femora not extending beyond the margin of the elytra, and the elytra more or less distinctly striate. The larva is beautifully figured by Schiödt (De Metamorphosi Eleutheratorum, Part viii. Fig. xviii. 1); it does not differ materially from the ordinary Lucanide form; the head is rather small, and the front part of the body considerably thicker than the hinder part, which appears to be less curled up towards the abdomen than is usually the case; it lives in wood of ash, willow, &c., and sometimes does considerable damage, although it appears chiefly to attack trees that are either decayed or about to decay, and therefore its ravages are more apparent than real.

S. cylindricum, L. (*juvenile*, Muls.). Oblong, cylindrical, parallel-sided, very convex, shining black, very strongly sculptured; head small, strongly punctured, with a rather long recurved horn in the male, which is furnished behind towards apex with long yellowish hairs; in the female the horn is reduced to a larger or smaller tubercle, and is glabrous; thorax strongly depressed in front, very strongly punctured behind depression, more closely in female than in male, with smooth central line; in the latter sex the anterior angles of the thorax are very prominent, and the anterior depression is furnished with large and very shallow punctures; its posterior margin is strongly raised and tridentate, the central tooth being large and blunt, and almost taking the form of a short horn; in the female the anterior angles are not prominent, and the depression with its margins and teeth are evident but much less apparent, the latter being merely indicated by blunt prominences; scutellum smooth; elytra very strongly punctured and more or less distinctly striated, with a row of smaller punctures on each side of suture; antennæ ferruginous or pitchy red; legs black, with tarsi lighter, strongly spinose externally. L. 8–12 mm.

In rotten ash, beech, willow, &c.; generally distributed throughout England and

Wales, and rather common from the midland counties southwards; it is, however, rarer further north; Scotland, rare, Tay, Dee, and Moray districts; it is probably not uncommon in Ireland.

(*Platycerus*, Geoffrey; *Systemocerus*, Weise. As this genus of the Lucanidæ, represented by the single species *P. caraboides*, has been included in all our old catalogues, it can hardly be passed over without notice; the genus is allied to *Lucanus* and *Dorcus*, but differs in having the eyes entire, and in the shape of the club of the antennæ, the first joint of which is very small, the second and third narrow and laterally elongate, and the last very large, subovate; from *Sinodendron* it differs in its depressed form, and in the fact that the posterior femora project beyond the sides of elytra.

P. caraboides, L. Blue or greenish, rather shining; head and mandibles larger in male than in female, the former rather closely punctured and pubescent; thorax transverse, with margins strongly raised, rounded at sides which are sinuate behind, thickly and distinctly punctured; elytra with rows of punctures which are rather thick and comparatively fine; interstices somewhat rugose; under-side pitchy black, rather strongly pubescent; legs black or pitchy black. L. 8-12 mm.

Stephens records the species as very rare in Britain, and says that "specimens have been taken by Mr. Waring of Bristol" and others in Scotland, and that it has also occurred near Oxford, and in the west of England; I have a specimen in my collection which I purchased from the collection of the late Mr. E. Brown of Burton-on-Trent, and which was labelled "e coll. Children;" Erichson records the species as widely distributed throughout Germany, and Thomson speaks of it as "not rare on young leaves of oak, birch, and aspen, and as spread over all Scandinavia;" it appears that it may very probably be really indigenous in our country, although very rare.)

SCARABÆIDÆ.

This family, which is co-extensive with the Petalocera of Dumeril, is one of the largest and most important families of the Coleoptera; in the Munich catalogue about six hundred genera, containing about six thousand and fifty species, are enumerated, and since its publication a large number of genera and species have been added to it, as may be judged from the fact that in the Supplement of the Cétonides by M. Bergé, published in 1884, no less than eight hundred and fifty species, and about one hundred and fifty new genera are enumerated as having been described since the publication of the Munich catalogue in 1869.

The largest known members of the Coleoptera belong to this family, and some of them, as has been already mentioned, are distinguished by the very great development of the horns on the head and thorax; a great number of them are dung-feeders, and as such act as most useful scavengers; among these may especially be mentioned the members of

the genus *Ateuchus*, which roll up balls of dung with their hind legs, and deposit their eggs in the centre; the larva, when hatched, finds its food prepared for it, and when it has consumed it, it is full-grown and ready to turn into the pupa state; the famous Egyptian "Sacred beetle" or "Scarabæus" is a close ally of this genus, if it is not to be identified with it; we perpetually find representations of this beetle in Egyptian mummies and sarcophagi; it was apparently regarded as sacred partly because of its valuable work as a scavenger, and partly because its motions while rolling along the balls of dung were regarded as mystically representing the motions of the earth and sun, &c.; one of these Egyptian figures is represented in Vol. I., Introduction, page xvii.

The earliest known beetles mentioned by the ancients belong to this family, viz. the Coprion, Heliocantharus, and Cantharus; the latter beetle is referred to in the "Pax" of Aristophanes (L. 1-7, &c.), where two attendants are introduced as feeding the Cantharus in the following dialogue:—

- Οἰκέτης A. Αἶρ' αἶρε μᾶζαν ὥς τάχιστα κανθάρω.
 Οἰκέτης B. ἰδοὺ δὲς αὐτῷ, τῷ κάκιστ' ἀπολουμένῳ,
 καὶ μήποτ' αὐτῆς μᾶζαν ἡδίῳ φάγοι.
 O. A. δὲς μᾶζαν ἑτέραν ἐξ ὀνίδων πεπλασμένην.
 O. B. ἰδοὺ μάλ' αὖθις· ποῦ γὰρ, ἦν νῦν δὴ 'φερες;
 οὐ κατέφαγεν;
 O. A. μὰ τὸν Δῖ' ἄλλ' ἐξαρπάσας
 ὅλην ἐνέκαμψε περικυλίσας τοῖν ποδοῖν.

Which may be freely translated:—

SERVANT 1. Bring a cake as quickly as possible for the Cantharus.

SERVANT 2. There it is, give it him, and may curses light on him, and may he never taste a sweeter cake.

SERVANT 1. Give him another cake kneaded from asses' dung.

SERVANT 2. Well, there is another; but where is that which you just offered him? Did he not eat it all?

SERVANT 1. Yes, by Jupiter, he seized it and rolled it up into a ball with his feet and gulped it down whole.

As a rule the species belonging to this family are dark-coloured, but occasionally, as in *Phanæus*, they are very brilliantly coloured and strongly metallic, and thus upset the theories of those who have believed that the plant-feeding beetles are alone metallic and gaily coloured, whereas all the dung-feeders are inconspicuous.

With the exception of the genus *Aphodius*, the family is very poorly represented in Europe, and is chiefly characteristic of warmer and tropical climates.

The family has been classified in various ways by different authors; Erichson divides it into two divisions, the Laparosticti and the Pleurosticti, but as the Melolonthini appear to be intermediate between these, I have followed the triple division adopted by Dr. Leconte and Dr. Horn in the Classification of the Coleoptera of North America, p. 237.

- I. Abdominal spiracles situated in the membrane connecting the dorsal and ventral corneous plates, the last one covered by the elytra. Ligula always separate from the mentum SCARABÆIDÆ LAPAROSTICTI.
- II. Abdominal spiracles in part situated on the superior portions of the ventral segments, the last one usually visible behind the elytra; the rows of spiracles feebly diverging. Ligula sometimes free, usually connate with the mentum SCARABÆIDÆ MELOLONTHINI.
- III. Abdominal spiracles (except the anterior ones) situated in the dorsal portion of the last ventral segments, forming rows which diverge strongly; last one or two spiracles usually visible behind the elytra. Ligula always connate with the mentum . SCARABÆIDÆ PLEUROSCTICTI.

SCARABÆIDÆ LAPAROSTICTI.

The British species belonging to this division may be separated into the following tribes:—

- I. Abdomen with six visible ventral segments.
 - i. Intermediate coxæ longitudinal, very widely distant; scutellum hidden or almost hidden COPRINA.
 - ii. Intermediate coxæ oblique, not or scarcely distant; scutellum distinct, sometimes very large.
 - 1. Antennæ with nine joints; epimera of metasternum covered APHODIINA.
 - 2. Antennæ with eleven joints; epimera of metasternum free at apex GEOTRUPINA.
- II. Abdomen with five visible ventral segments TROGINA.

COPRINA.

The species belonging to this tribe are round or oval, and often very convex; they are very easily known by their linear and longitudinal intermediate coxæ, which are very widely separated, and by having the scutellum hidden or almost hidden; the clypeus is large and entirely covers the mouth organs; in some genera organs of stridulation are found in both sexes; the species live almost entirely in dung; it is to this tribe that the Egyptian Scarabæi or “sacred beetles” belong; ten genera, containing seventy species, are found in Europe, of which only two genera, containing eight species, occur in Britain; these may be distinguished as follows:—

- I. Upper surface very convex; third joint of labial palpi distinct COPRIS, Geoff.
- II. Upper surface depressed; third joint of labial palpi very small, obsolete ONTHOPHAGUS, Latr.

COPRIS, Geoffroy.

This genus contains more than fifty species, which are widely distributed, but are chiefly found in hot and tropical countries; only two occur in Europe, of which one is found in Britain; it is the nearest relation of the true Scarabæi of hot climates that we possess; the genus differs from *Onthophagus* by its convex and more oblong form, emarginate clypeus, and proportionally much shorter thorax; the species burrow

obliquely for some distance below the dung which they frequent in order to deposit their eggs in safety.

C. lunaris, L. Suboblong, convex, of about the same size as *Geotrupes stercorarius*, entirely black, shining, with the under-side of head and anterior femora, and sides of the pro- meso- and metasternum clothed with ferruginous hairs; head semicircular in front, with a frontal horn, and with a somewhat uneven raised margin, which is sharply incised in centre; thorax strongly reflexed in front, rather deeply channelled longitudinally, differing in the sexes; scutellum apparently wanting; elytra strongly striate, with the striae very feebly, and in some cases almost imperceptibly, crenate, interstices slightly convex, sparingly and exceedingly finely punctured; pygidium visible, strongly reflexed, coarsely punctured; legs black, tarsi clothed with reddish hairs. L. 14–20 mm.

Male with a long pointed horn on the head, which is, as a rule, very slightly recurved towards apex; at its base on the inner side are two small teeth, and the whole inner surface is rugose and uneven; the thorax is deeply excavated on both sides in front, and furnished at the sides of the excavation with a broad and short, but very distinct, horn, or horn-like prominence.

Female with a short horn on head which is emarginate at apex, and the thorax very closely punctured in front with two shallow impressions answering to the excavations in the male, on each side of which is a more or less obsolete prominence; occasionally these are almost wanting, and the depressions are only feebly indicated.

The formation of the thorax is variable, and occasionally small specimens of the male are found which have the thorax formed as in the female, and the horn on the head short as in that sex; the apex of the horn, however, appears not to be emarginate in the male, even in these specimens, but always more or less acuminate; in no case does the female ever present the formation of the male thorax.

Sandy places; in dung; local, but sometimes not uncommon where it occurs; Greenwich, Charlton, Birch Wood, Bexley, Chatham, Croydon, Richmond; Bungay, Suffolk; Bournemouth; Shoreham; Bath (common in one field only, R. Gillo); Whitmore, Staffordshire (Chappell).

ONTHOPHAGUS, Latreille.

This genus is one of the largest in point of numbers that are found among the Scarabæidæ; it contains upwards of three hundred and fifty species; these are found chiefly in hot and tropical countries, and appear to be more characteristic of the Old than the New World, although this may perhaps be found not to be really the case; the species are distinguished by their ovate and rather depressed form and almost crescent-shaped thorax, which is long in proportion to the elytra; the third joint of the labial palpi is obsolete, and the tarsal claws are distinct, and situated at the end of a rather long onychium.

The larvæ of *Onthophagus*, like the perfect insect, are found in dung, and are very useful scavengers; the female forms a separate mass of dung for each larva, about the size of an acorn, and buries it at a greater or less depth in the earth; in this she deposits an egg, and closes the opening; in about ten days the larva hatches, and begins to devour its abode, and in about two and a half months reaches its full size, and changes into a pupa; the pupal state only lasts for a short time; the larvæ are white, with the head yellowish, sometimes with a longitudinal greyish streak on the front part of the body, subcylindrical from the head to the middle abdominal segment, and then somewhat gibbous to the sixth segment, which is furnished with a prominence on disc that is used by the larva for locomotion; from thence to apex the body is curved downwards; the legs are rather long, and are destitute of claws, as is the case with other dung-feeding species.

Thirty-three species of the genus are found in Europe, of which seven occur in Britain; although they are easily recognized if compared together, yet the descriptions usually given by Erichson and Thomson, &c., are in one or two cases somewhat hard to work species out by, and a little apt to cause confusion.

I. Colour unicolorous black.

i. Head with one or two horns in male; length 5-10 mm.

1. Head with two horns in male; thorax punctured. *O. TAURUS, L.*

2. Head with the vertex in male prolonged into a plate terminating in a long horn; thorax punctate-granulate *O. NUTANS, F.*

ii. Head with a transverse raised ridge in male; length 4-4½ mm. *O. OVATUS, L.*

II. Elytra yellowish-testaceous or fusco-testaceous, either almost unicolorous or with more or less pronounced dark markings; head with a horn on vertex in male.

i. Elytra with dark markings very cloudy and indistinct, and, as a rule, almost unicolorous testaceous . *O. CÆNOBITA, Herbst.*

ii. Elytra with dark markings distinct.

1. Head and thorax bronze-green or coppery; dark markings on elytra not, or scarcely, reticulate.

A. Sculpture of thorax more or less granulate; average size larger; pygidium more distinctly punctured *O. VACCA, L.*

B. Sculpture of thorax asperate punctate; average size smaller; pygidium more obsoletely punctured *O. FRACTICORNIS, Preys.*

2. Head and thorax black, with very slight bronze reflection; dark markings on elytra more or less plainly reticulate *O. NUCHICORNIS, L.*

O. taurus, L. Black, rather dull, sometimes with a slight greenish metallic reflection on thorax; head rather long, semi-ovate, with a raised margin, rugosely punctured; antennæ reddish, with blackish club; thorax rounded at sides and base, with anterior angles blunt, rather diffusely and not strongly punctured; elytra with feeble and obsoletely punctured striæ, the interstices dull, sparingly punctured and shagreened; legs blackish or dark reddish-brown. L. 7-10 mm.

Male with two long horns on vertex of head, which are curved and divergent.

Female with the head more thickly and strongly punctured than in the male, with two transverse keels, one between antennæ and one between eyes; the thorax also is more strongly punctured than in the male, and is strongly reflexed in front.

In some of the males the horns are very short and straight, or even almost wanting.

In dung; very rare and somewhat doubtfully indigenous; Brockenhurst and Lyndhurst, New Forest (Stephens); Exmouth, rare (Parfitt's Devonshire Catalogue, p. 68); the species is rather common in Jersey, and many of the specimens in our collections come from that and the adjacent islands.

O. nutans, F. (*verticicornis*, Laich). Black, dull, occasionally with a greenish reflection on the vertex of the head and on thorax; head varying in the sexes, antennæ brown with blackish club; thorax thickly punctured, each puncture being flanked with a raised granule, rather short, with anterior angles projecting; elytra with fine and obsoletely punctured striæ, interstices finely granulate; legs black, tarsi sometimes brownish. L. $7-8\frac{1}{2}$ mm.

Male with the head subtriangular, sparingly and finely punctured, with the vertex produced into a broad plate which is continued into a large flat curved horn; thorax reflexed in front, strongly sinuate or emarginate in middle of anterior margin.

Female with the head rounder and more thickly and strongly punctured, with two transverse carinæ; thorax reflexed in front, depressed on both sides, and produced in middle in the form of two tubercles.

In the male the horns are sometimes more or less obsolete, and the head shorter.

In dung; not common; Chingford; Walthamstow; Bath (in some numbers in one field only in May, R. Gillo); Swansea.

O. ovatus, L. Much smaller than either of the preceding species, black, dull, occasionally with a feeble metallic reflection on thorax; head rounded in front, with a raised margin which is slightly emarginate in middle, rather diffusely punctured behind, more thickly in front; thorax short, rather thickly punctate-granulate, anterior angles blunt; elytra with obsolete and very feebly crenate striæ, interstices granulate in irregular rows; legs black, tarsi sometimes pitchy. L. $4-4\frac{1}{2}$ mm.

Male with a raised transverse carina between eyes; female with two carinæ on head, of which the front one is curved; the latter is sometimes indicated in small specimens of the male.

In dung, vegetable refuse, &c.; generally distributed and common throughout the London district and the south; not so common in the Midlands and further north; Bewdley; Church Stretton; Bath; Swansea; Barmouth; Repton; Blackpool; Morecambe; not recorded from the Northumberland and Durham district; Scotland, very local, Forth district only; it is probably local in Ireland.

O. cœnobita, Herbst. Head and thorax of a rather bright æneous green colour, or coppery, elytra of a rather brighter testaceous colour than in the three following species, with the dark markings very indis-

tinct, and often almost wanting, so that the elytra appear unicolorous; head rather long with strong raised margin; antennæ reddish with blackish club; thorax rounded at base and sides, slightly sinuate before anterior angles which are strongly projecting, very thickly and asperately punctured; elytra with very shallow striæ, which are obsoletely punctured, interstices broad sparingly and rather distinctly punctured; legs black with tarsi somewhat ferruginous, posterior tibiæ with apical setæ unequal. L. $4\frac{1}{2}$ – $6\frac{1}{2}$ mm.

Male with the head sparingly punctured, and the vertex raised into a plate at back, terminating in a more or less curved horn; thorax reflexed in front, simple.

Female with the head more closely punctured and furnished with two transverse keels, the one at back of vertex being rather strongly raised; thorax reflexed, slightly projecting in middle of apical margin.

In dung; generally distributed and common in the London district, and the greater part of the south of England, but much less common further north, and not apparently recorded from the northern counties or from Scotland; Swansea; Bath; Needwood Forest; Repton, Burton-on-Trent.

O. vacca, L. Head and thorax dark bronze-green or coppery, rather dull, elytra testaceous or reddish-testaceous with distinct irregular dark-green markings, which in an ordinary light often appear almost black; head rather large, strongly margined, varying in the sexes; antennæ red with blackish club; thorax finely and rather thickly granulate, a character which is usually given as distinguishing the species, but is unsatisfactory, as the punctures on the thorax of the allied species are asperate, and give the upper surface a granulate appearance; the base and sides are rounded, and the latter are not sinuate before the anterior angles which are obtuse; elytra with shallow and very obsoletely punctured striæ, interstices finely granulate in irregular rows; legs black, tarsi dark ferruginous; the species is variable in size, but on the average is larger than any other of our British species. L. 7–10 mm.

Male with the head elliptical in front, with the vertex extended into a sloping plate, dentate on each side, and terminating in an erect spiniform horn; thorax reflexed in front, sinuate in middle of apical margin.

Female with the head round in front, and furnished with two transverse keels, the hinder of which is more elevated and more or less distinctly raised into a short horn at each side; thorax reflexed in front, with a slight prominence in middle of apical margin which is more or less distinctly bituberculate.

In some small males the plate on vertex is small and terminates in an abbreviated horn, and the thorax is shaped as in the female.

In dung; local; generally distributed and common in the London district, Kent, Surrey, and the greater part of the south of England; Brent Knoll, Somerset, in

sheep's dung; I know of no locality further north than the districts here mentioned.

O. fracticornis, Payk. Head and thorax dark bronze-green or coppery, rather dull, elytra livid-testaceous with distinct irregular black markings; head rather large with raised margin, antennæ brown with blackish club; thorax with base and sides rounded, the latter slightly sinuate before anterior angles, which are rather prominent, upper surface thickly and asperately punctured; elytra with shallow and obsoletely punctured striæ, interstices flat, rather distinctly punctured, almost in two rows; legs black with tarsi more or less ferruginous; pygidium sparingly and obsoletely punctured; posterior tibiæ with apical setæ unequal. L. 4–8 mm.

Male with the head rather longer and more sparingly punctured than in female, with the vertex raised into a broad plate, which is feebly dentate on each side, and terminates in a more or less curved horn, thorax reflexed in front, simple in both sexes.

Female with the head furnished with two transverse keels, smaller and more thickly and strongly punctured than in male.

In some males the plate and horn on vertex is much abbreviated, and occasionally resolves itself into a carina, much as in female.

In dung; local, and commoner near the coast than inland; not uncommon in the London district; Shirley, Wimbledon, &c.; Whitstable; Deal; Dover; Hastings; Bournemouth; New Forest; Isle of Wight; Burnham, Somerset; Bath; South Wales; Barmouth; Dean Forest; Bewdley Forest; Huntingdonshire; Cleethorpes, Lincolnshire; Liverpool district; not recorded from the extreme north of England or from Scotland.

O. nuchicornis, L. This species is closely allied to the preceding, but may easily be recognized by the following characters: the head and thorax are of a dull-black colour with very little metallic reflection; the thorax has the sides rounded without any sinuation before anterior angles, and the elytra have the dark markings more or less distinctly reticulate; the pygidium also is more distinctly punctured, and the apical setæ of the posterior tibiæ are equal; the plate on vertex, which terminates in a horn, is not quite so broad, and the anterior margin of the thorax in the female is protuberant in the middle; the average size appears to be rather smaller, but this is a character that cannot be depended upon, as the species belonging to the genus are extremely variable in size. L. 5–8 mm.

In dung; the most widely distributed of all our species; not uncommon in the Midlands and the south, but very rare in the north and in Scotland; London district, not uncommon, Shirley, Chingford, Forest Row, Belvedere, Addington, Greenwich, Gravesend; Delamere Forest; Whitstable; Deal; Hastings; Glanvilles Wootton; Isle of Wight; Devon; Burnham, Somerset; Swansea; Barmouth; Sutton Park, Birmingham; Hunstanton; Lincoln; Cleethorpes; Blackpool; South Shields, very rare; Scotland, very rare, Forth district, "Ayrshire, Mr. J. P. Duncan, Murray's Cat."

APHODIINA.

The species belonging to this tribe are of small size, and of more or less oblong and convex form; the mouth organs (except in one genus, *Ægialia*, in which the mandibles are visible from above) are concealed by the clypeus, as in the Coprina; the antennæ are 9-jointed with a 3-jointed club, and the posterior tibiæ are furnished with two spurs; the tribe is well represented both in the European and the British fauna, its members taking the place in colder and temperate climates of the larger Scarabæidæ of warm and tropical climates; the genera found in Britain may be distinguished as follows:—

I. Mandibles concealed beneath the clypeus.

i. Thorax without transverse furrows or costæ.

1. Eyes with at least the anterior margins free.

A. Elytra simply striated.*

a. Elytra rounded at apex *APHODIUS*, Ill.b. Elytra with the sutural angles produced into a small tooth at apex *PLAGIOGONUS*, Muls.

B. Elytra more or less distinctly carinate.

a. Thorax without longitudinal furrow at base . . . *HEPTAULACUS*, Muls.b. Thorax with a broad longitudinal furrow at all events at base *OXYOMUS*, Lap.2. Eyes entirely concealed *AMMÆCIUS*, Muls.

ii. Thorax costate or furrowed transversely.

1. Hind tarsi with elongate more or less cylindrical joints . . . *RHYSSEMUS*, Muls.2. Hind tarsi with triangular joints *PSAMMOBIUS*, Heer.II. Mandibles visible beyond the clypeus; eyes covered . . . *ÆGIALIA*, Latr.**APHODIUS**, Illiger.

This genus contains between three and four hundred species, and it is very probable that the number will be largely increased; a certain proportion are found in tropical countries, but as a rule they are characteristic of temperate and colder climates, in which they take the place of the larger Scarabæidæ which are found in hotter regions; they are extremely useful scavengers, and during the spring, summer, and autumn may be found abundantly in dung; they may also be observed flying and settling in swarms on roads and other places frequented by sheep, horses, or cattle. I have seen *Aphodius punctato-sulcatus* on the wing on the Malvern Hills as early as January 16th.

The larva of *Aphodius fossor* is described and figured by Chapuis et Candèze (Les Larves des Coléoptères, p. 124, Plate iv. fig. 3); it is of a bluish-white colour with the head brown, and the mandibles long, slender, and black; the antennæ are comparatively long, and are 5-jointed; the anterior pair of legs are shorter than the intermediate and posterior; the abdominal segments are divided into transverse folds; in general form and appearance the larva does not differ materially from that of other species of *Aphodius* and other allied genera.

* *A. porcus*, F., has the interstices of the elytra depressed, and therefore appears at first sight to be an exception.

No less than one hundred and nineteen species of the genus are found in Europe, of which thirty-nine occur in Britain; these may be divided as follows:—

- I. Scutellum large or very large.
 - i. Elytra yellowish or brownish-yellow; posterior tibiæ with apical setæ unequal *A. ERRATICUS, L.*
 - ii. Elytra black; posterior tibiæ with apical setæ equal.
 1. Upper surface depressed; striæ of elytra near suture sulcate *A. SUBTERRANEUS, L.*
 2. Upper surface convex; striæ of elytra finer, not sulcate *A. FOSSOR, L.*
 - iii. Elytra black, with apex more or less broadly red; posterior tibiæ with apical setæ equal *A. HÆMORRHOIDALIS, L.*
- II. Scutellum moderate or small.
 - i. Posterior tibiæ furnished with short apical setæ which are of equal length.
 1. Base of thorax distinctly bordered throughout.
 - A. Thorax very slightly sinuate before posterior angles, more or less plainly impressed in front in male; mesosternum not carinate.
 - a. Thorax black, with anterior angles red; elytra bright red.
 - a*. Abdomen nearly always more or less red; thorax longer in proportion *A. FÆTENS, F.*
 - b*. Abdomen black; thorax shorter in proportion *A. FIMETARIUS, L.*
 - b. Thorax black unicolorous; elytra of a dirty-yellowish colour, with a more or less distinct dark band at sides *A. SCYBALARIUS, F.*
 - B. Thorax not sinuate before posterior angles, with sides nearly straight.
 - a. Mesosternum finely carinate between intermediate coxæ.
 - a*. Upper surface entirely or almost entirely black.
 - a†. Thorax closely punctured.
 - a‡. Elytra dull, shorter *A. ATER, De G.*
 - b‡. Elytra shining, longer *A. CONSTANS, Duft.*
 - b†. Thorax very diffusely punctured *A. GRANARIUS, L.*
 - b*. Elytra yellowish or reddish-yellow, with suture darker *A. NITIDULUS, F.*
 - b. Mesosternum not carinate between intermediate coxæ
 - a*. Seventh stria of elytra not produced beyond the adjacent striæ; clypeus straight or nearly straight, with anterior margin broadly red.
 - a†. Form more depressed; apex of elytra dull, pubescent *A. SORDIDUS, F.*
 - b†. Form more convex; apex of elytra shining, glabrous *A. RUFESCENS, F.*
 - b*. Seventh stria of elytra produced considerably beyond the adjacent striæ;

- clypeus as a rule rather strongly sinuate, black, or with very narrow reddish anterior margin.
- a†. Elytra not or not strongly widened behind, more or less red or pitchy red.
- a†. Size larger; spurs of posterior tibiæ longer A. LAPPONUM, *Gyll.*
- b†. Size smaller; spurs of posterior tibiæ shorter.
- *. Elytra lighter; head distinctly and rather strongly punctured A. FÆTIDUS, *F.*
- **. Elytra darker; head very finely punctured A. PUTRIDUS, *Cr.*
- b†. Elytra strongly widened behind; upper surface entirely black A. NEMORALIS, *Er.*
2. Base of thorax not bordered except at most near posterior angles.
- A. Elytra black or black with an oblique red spot; thorax with sides straighter A. PLAGIATUS, *L.*
- B. Elytra of a more or less livid yellowish colour; thorax with sides somewhat rounded A. LIVIDUS, *Ol.*
- ii. Posterior tibiæ furnished with short bristles at apex intermingled with larger ones.
1. Base of thorax bordered.
- A. Elytra very dull with interstices rugose.
- a. Forehead with obsolete tubercles; interstices depressed; elytra of a dark reddish colour; length 4-5 mm. A. POROUS, *F.*
- b. Forehead without tubercles; interstices flat; elytra black; length 2-3 mm. A. SCROFA, *F.*
- B. Elytra with interstices punctured, more or less shiny.
- a. Mesosternum carinate between intermediate coxæ.
- a*. Elytra black or black with reddish or yellowish-red markings.
- a†. First joint of posterior tarsi dilated, shorter; thorax unicolorous black A. TRISTIS, *Panz.*
- b†. First joint of posterior tarsi not dilated, longer.
- a†. Thorax black with reddish spot at anterior angles which is sometimes obsolete; elytra black with indistinct cloudy reddish markings A. PUSILLUS, *Herbst.*
- b†. Thorax black; elytra black with two well-marked yellowish-red spots on each A. QUADRIMACULATUS, *L.*
- b*. Elytra yellowish with suture alone dark A. MERDARIUS, *F.*
- c*. Elytra yellowish with variable black spots and streaks.
- a†. Size smaller; anterior angles of thorax reddish; anterior dark marking in second interstice of elytra situated before middle A. INQUINATUS, *F.*
- b†. Size larger; sides of thorax entirely reddish; anterior dark marking in

- second interstice of elytra situated in middle (A. MELANOSTICTUS, *Schmidt*.)
- b. Mesosternum not carinate between intermediate coxæ.
- a*. Thorax finely bordered at sides; intermediate coxæ placed nearer together.
- a†. Legs pitchy black or pitchy; elytra yellow with conspicuous black markings A. TESSULATUS, *Payk*.
- b†. Legs more or less testaceous or yellowish.
- a†. Elytra yellowish with distinct black markings; prominences on forehead distinct at least in male.
- *. Palpi black or dark brown, sometimes lighter at base A. CONSPURCATUS, *L*.
- **. Palpi reddish or reddish-yellow A. STICTICUS, *Panz*.
- b†. Elytra of a livid colour with sides sometimes furnished with a darker band, often with apex and margins towards apex lighter; prominences on forehead obsolete A. CONSPUTUS, *Cr*.
- b* Thorax rather strongly bordered at sides; intermediate coxæ placed further apart.
- a†. Posterior angles of thorax obtuse, well marked.
- a†. Size smaller; male with the apical spines of anterior tibiæ pointed at apex; thorax, as a rule, more distinctly punctured A. PUNCTATO-SULCATUS, *Sturm*.
- b†. Size larger; male with the apical spines of anterior tibiæ blunt at apex; thorax, as a rule, less punctured, often almost smooth A. PRODROMUS, *Brahm*.
- b†. Posterior angles of thorax rounded.
- a†. Sides of thorax fringed with long hairs A. CONTAMINATUS, *Herbst*.
- b†. Sides of thorax without hairs A. OBLITERATUS, *Panz*.
2. Base of thorax not bordered except at most near posterior angles.
- A. Size smaller; head with prominences distinct A. ZENKERI, *Germ*.
- B. Size larger; head without or with very obsolete prominences.
- a. Thorax closely and distinctly and moderately strongly punctured; apex of elytra finely pubescent A. LURIDUS, *F*.
- b. Thorax rather finely or extremely finely punctured; apex of elytra not pubescent.
- a*. Elytra much longer in proportion to thorax; form subcylindrical, convex; thorax almost smooth; length 10-12 mm. A. RUFIPES, *L*.
- b*. Elytra shorter in proportion to thorax; upper surface depressed; thorax finely but distinctly punctured; length 6-9 mm. A. DEPRESSUS, *Kug*.

A. erraticus, *L*. (*Colobopterus erraticus*, *Muls*). Broad, depressed, black with the elytra of a dirty-yellow colour, sometimes with more or less obscure cloudy dark bands at sides; head thickly and finely punc-

tured, antennæ and palpi black; thorax large, rather thickly and finely punctured, margined at sides and base; scutellum long and pointed, thickly punctured; elytra depressed, truncate at apex, with fine crenulate striæ and very broad thickly and finely punctured interstices; legs black, posterior tarsi with the external spur slightly longer than the first joint of the tarsi. L. 7–8 mm.

Male with a distinct tubercle on the centre of the forehead.

In dung; generally distributed and common throughout the greater part of England and Wales, but not so common in the extreme north; Scotland, not common, Solway, Tweed, and Forth districts; Ireland, near Dublin and Waterford, and probably common.

A. subterraneus, L. (*Eupleurus subterraneus*, Muls.). Oblong, subparallel, a little narrowed at apex, depressed, shining black; head finely punctured, clypeus rugose, antennæ yellowish with club darker, palpi reddish-brown; thorax large, slightly narrowed in front, with very diffuse and irregular large coarse punctures; scutellum large, pointed, thickly and rugosely punctured; elytra with very strong finely crenate striæ, those near suture being strongly sulcate with the interstices carinate; legs black with tarsi ferruginous. L. $4\frac{1}{2}$ –6 mm.

Male with the central frontal tubercle larger than the other two;* thorax with a small fovea in front.

In dung; not as common as many of the other species, but widely distributed from the midland counties southwards; it is less common further north, and has not been recorded from Scotland. Ireland, near Belfast.

A. fossor, L. (*Teuchestes fossor*, Muls.). One of our largest species; oblong, very convex, shining black; head short sparingly and finely punctured, antennæ and palpi brown, the former with blackish club; thorax large, convex, with large irregular scattered punctures; scutellum large, obsoletely punctured; elytra with rather weak feebly crenate striæ, interstices broad, impunctate; legs black, tarsi reddish-brown. L. 8–10 mm.

Male with the three frontal prominences, especially the central one, distinct, and with the thorax plainly foveate in front.

In dung, &c.; common and generally distributed throughout the greater part of England and Wales, but not so common in the north; Scotland, not common, Solway and Dee and probably other districts; Ireland, near Belfast, Armagh, and Dublin, and probably common.

A. hæmorrhoidalis, L. (*Otophorus hæmorrhoidalis*, Muls.). A small and short convex species, which is at once distinguished from all the other smaller species by its very large scutellum; black, rather shining with a more or less distinct red spot at the shoulders of the elytra, which are also more or less broadly red behind; head rather thickly and finely punctured, palpi brown, antennæ brownish-yellow

* In most of the species of the genus there are three more or less distinct tubercles on the forehead arranged transversely, the central one being the most pronounced especially in the male; occasionally they are very obsolete, and sometimes quite absent.

with blackish club; thorax large, coarsely punctured with an intermixture of fine small punctures; elytra short with rather strong crenate striæ, the interstices flat and very finely punctured; legs black or pitchy with reddish tarsi. L. $3-4\frac{1}{2}$ mm.

Male with the thorax broader and more diffusely punctured on disc than in the female, and with the central frontal tubercle more distinct.

In dung; generally distributed and common throughout the greater part of England and Wales; not so common further north, and very doubtful as Scottish, the only record being "Fields near Colinton and irrigated meadows at Restalrig" (Ent. Edin.), which Dr. Sharp considers as very probably erroneous. I have no record of the species from Ireland, but it almost certainly occurs in that country.

A. foetens, F. Subovate, rather broad, convex, shining black with the elytra bright red, and the anterior angles of thorax yellowish-red, abdomen almost always red; head finely punctured, antennæ red with reddish-yellow club, palpi red with the base of the last joint blackish; thorax ample, with large and irregular scattered punctures, the space between being extremely finely punctured; scutellum moderate, punctured; elytra with rather strong crenate striæ, the interstices broad and almost smooth; legs black or reddish-black with the tarsi reddish. L. 5-7 mm.

Male with the central frontal tubercle sharply raised, and the thorax impressed in front.

In dung; local; London district, not common, Mickleham, Shirley, Addington; St. Peter's, Kent; Pegwell Bay; Folkestone; Hastings; Dover; Glanvilles Wootton; Devon; Bath; Burnham, Somerset; Swansea; Hunstanton; Midland districts, widely distributed; Scalby, York; Cleethorpes; Liverpool; Northumberland and Durham district; Scotland, very rare, Forth district; Dr. Sharp once found a colony of the species at North Queensferry on June 20th, 1865; Ireland, near Dublin.

A. fimetarius, L. Black, shining, with the elytra bright red and the abdomen entirely black; very closely allied to the preceding, but apart from the colour of the abdomen it may be distinguished by its narrower form, shorter and evidently more transverse thorax, and proportionally longer elytra; the forehead in the male has the usual three tubercles obsolete, and in the female they are almost wanting; the metasternum, moreover, in the former sex is impressed. L. 4-6 mm.

In dung; very abundant and generally distributed throughout the kingdom.

In the "Entomologist's Monthly Magazine," vol. xxii. p. 163, will be found a note by myself regarding an article by M. des Gozis in the "Revue d'Entomologie" for 1885, Nos. 4 and 5, concerning certain closely allied species of Coleoptera; in this article he says that a convenient character for separating *A. foetens* and *A. fimetarius* is presented by the apical region of the elytra, which in the former is finely punctured, but is still smooth and shining, and differs in no respect from the interstices on the disc; in *A. fimetarius*, however, it is rugose and dull, and thus differs very much from the interstices on the disc which are smooth and polished; it is certainly true that the apical region is more punctured in *A. fimetarius* than in *A. foetens*, yet this may be

applied to the whole of the disc as well, as may be seen by examining them under a strong power; the difference, however, is very slight, and is much more apparent in some specimens than in others, and cannot therefore be always depended upon.

A. scybalarius, F. Oblong, convex, black, shining, with the elytra dirty-yellow, almost always furnished with a narrower or broader dark longitudinal band at sides, which is often not sharply defined; head thickly punctured, antennæ brownish-yellow with blackish club; thorax with large irregular punctures which are usually thicker at base and sides, the spaces between them exceedingly finely punctured; scutellum moderate, punctured, smooth at apex; elytra with rather strong crenate striæ, interstices broad and very finely punctured, almost smooth; legs lighter or darker pitchy-brown with tarsi lighter. L. $4\frac{1}{2}$ –7 mm.

Male with the central frontal tubercle strongly raised, thorax impressed in front.

In dung, haystack and flood refuse, &c.; common and generally distributed throughout the greater part of England, but apparently commoner on or near the coast than inland; rarer in the north; Scotland, not common, Forth and Moray districts; Ireland, near Dublin, and probably widely distributed.

A. ater, De G. Short and rather broad, convex, black, or black with the elytra of an obscure reddish colour, head and thorax somewhat shiny, elytra dull; head rather sparingly punctured, clypeus rugose, antennæ and palpi pitchy brown, the former with a large club which is strongly pubescent and so of a greyish colour; thorax thickly and strongly punctured with an intermixture of smaller punctures, the punctuation being very close at the sides; scutellum moderately large; elytra with rather fine and finely crenate striæ, interstices flat, sparingly and finely punctured; legs black with tarsi pitchy or reddish brown. L. $3\frac{1}{3}$ – $4\frac{1}{2}$ mm.

Male with the central frontal tubercle raised, the thorax more closely punctured on disc than in female, and the metasternum impressed.

In dung; common and generally distributed throughout the kingdom.

A. constans, Duft. Oblong, convex, shining black; head punctured, clypeus rugose, antennæ dark brown with blackish club; thorax closely punctured, the punctures being of uneven size, with a more or less distinct smooth longitudinal line in centre; scutellum moderate, finely and rugosely punctured at base; elytra black or dark pitchy brown becoming obscurely lighter towards apex which is reddish-brown, with rather fine crenate striæ, the interstices being flat, finely punctured, and obsoletely wrinkled transversely; legs black or brown with the tarsi reddish-brown. L. 4–5 mm.

Male with the central frontal tubercle raised, and with a somewhat curved elevated raised line on clypeus.

In dung, &c.; local and, as a rule, rare; Belvedere (T. Wood); Ventnor, Isle of Wight; Devon; Bath, common in early spring (Gillo); Cheshire; Tintwistle, Yorkshire (Chappell); Northumberland and Durham district, Wallington (Power) and near Hartley; Scotland, very local, Tay district, recorded by Dr. Sharp as common in ox-dung at Rannoch in the first week of May, 1866.

This species very closely resembles *A. granarius*, but may be at once known by the much thicker punctuation of the thorax.

A. granarius, L. (*concolor*, Muls.; *retusus*, Waltl.). Oblong, moderately convex, black, very shining; head thickly and rugosely punctured, antennæ brownish-yellow with blackish club; thorax with very diffuse and scattered large punctures which are more numerous in smaller examples, the spaces between exceedingly finely punctured, almost smooth; scutellum rather large, almost impunctate, or with only a few punctures; elytra with rather fine crenate striæ, black with the outer margins and apex more or less obscurely reddish-brown; legs lighter or darker reddish-brown with the tarsi ferruginous. L. 3-5 mm.

Male with the frontal tubercles more distinct than in female, and the clypeus furnished with a transverse raised line.

In dung, vegetable refuse, &c.; very common in the London district, and throughout Kent and Surrey, and widely distributed along the South Coast of England; rarer in the Midlands and further north; Northumberland and Durham district, Meldon, South Shields, &c., rare; not recorded from Scotland; Ireland, near Belfast.

A. nitidulus, F. Elongate, almost cylindrical, shining; head reddish with vertex dark, finely punctured, antennæ reddish-testaceous; thorax fuscous with sides more or less broadly red, finely and unevenly punctured; scutellum moderate, punctured at base; elytra long, testaceous or reddish-testaceous, with the suture very narrowly brown, with rather fine crenate striæ, the interstices being flat and exceedingly finely punctured, almost smooth; legs reddish-brown or brownish-yellow. L. 4-5 mm.

Male with the central frontal tubercle more distinct and with the thorax as broad as the elytra and very finely punctured, whereas in the female the thorax is narrower than the elytra and more strongly punctured.

In dung; local; London district, rather common, Darenth Wood, Ashted, Plumstead, Mickleham; Loughton; Southend; Deal; Sandwich; Eastbourne; Weymouth; Devon; Swansea; Hunstanton; Harwich; Cleethorpes; Liverpool; it usually occurs near the coast, and is not found in any of the midland counties, in the north of England, or in Scotland.

A. sordidus, F. Oblong, moderately convex, shining; head reddish with vertex darker, antennæ and palpi yellow; thorax dark with side margins broadly, and anterior and posterior margins narrowly, reddish, exceedingly finely punctured, with diffuse large punctures at sides; scutellum brown, punctured at base; elytra long, with moderate finely crenate striæ, of a dirty-testaceous colour with a spot at each

shoulder and a second behind middle dark, one or both of these being sometimes absent; apex dull, pubescent; the suture also is narrowly dark; legs reddish-yellow with the femora, in part at least, lighter. L. $4\frac{1}{2}$ – $6\frac{1}{2}$ mm.

Male with the intermediate frontal tubercle more distinct.

In dung; local; London district, not common, Battersea, Plumstead, Greenwich, Loughton, Belvedere, West Ham; Brighton; Devon; Swansea; Cleethorpes; Liverpool; Blackpool; Northumberland and Durham district; Scotland, rare, "not common near Edinburgh; Fife," Murray's Cat.; the species appears to be chiefly confined to the coast.

A. rufescens, F. (*rufus*, Moll.). Somewhat smaller than the preceding, and more convex, shining; colour variable, the elytra being of a reddish-testaceous colour with or without a dark cloudy band at sides, or entirely pitchy red, or dark pitchy brown, so that the whole insect appears of a dark pitchy colour; the clypeus is reddish and the vertex of head dark, and the thorax dark with more or less broadly red margins; the reddish portions in dark specimens are sometimes very obscure: the species very closely resembles *A. sordidus*, but is distinguished by its more convex form, and by the disc of the thorax being evidently more closely punctured, and by having the apex of the elytra shining and glabrous; the intermediate tibiæ, moreover, are furnished with five or six long cilia in the male, on their inner side. L. 4 – $5\frac{1}{2}$ mm.

In dung; local; Mickleham, Greenwich, Whitstable, Addington, Belvedere, Tonbridge; Pegwell Bay; Hythe; Hastings; Dover; Bath; Burnham, Somerset; Mendip Hills; Swansea; Tewkesbury; Birmingham district; Hunts; Essex; Hunstanton; Cleethorpes; York; Scarborough; Liverpool; Northumberland and Durham district; Scotland, common in the south, Solway, Tweed, and Forth districts; Ireland, Armagh; the species appears to occur more often near the coast than inland.

A. lapponum, Gyll. Oblong, rather broad, black, shining, with the elytra of a lighter or darker reddish colour, sometimes pitchy and occasionally almost black; antennæ reddish with club darker, palpi pitchy; thorax transverse, very finely and closely punctured with the anterior angles pitchy; elytra with rather feeble crenate striæ, the interstices being broad, very slightly convex near suture, and sparingly and extremely finely punctured; legs pitchy, with tarsi lighter. L. 4 – $5\frac{1}{2}$ mm.

Male with the central frontal tubercle raised, and the metasternum impressed in middle; the thorax also is broader and less closely punctured on disc than in female.

In dung, especially sheep's dung; a northern and mountain species, and rare in England and Wales except in the extreme north; Llangollen; Snowdon; Tintwistle and Greenfield, Yorkshire; Teesdale; Northumberland and Durham district; Scotland, Highlands, common in sheep's dung on moors and hill-sides, Tweed, Solway, Forth, Clyde, Tay, Dee, Moray, and probably all the other districts; Ireland, Newcastle, co. Down (Champion).

A. foetidus, F. (*putridus*, Herbst., *nec* Sturm). Much smaller

than the preceding, oblong, rather convex, black with the anterior angles of thorax and the elytra red, the latter usually furnished with cloudy dark markings; head very thickly punctured, antennæ reddish-brown with club dark, palpi pitchy; thorax a little narrower than elytra, very thickly and finely punctured, especially at the sides, the punctuation consisting of larger and smaller punctures intermingled; occasionally the whole margins as well as the anterior angles are reddish; scutellum moderate; elytra with rather fine, plainly crenate, striæ, interstices broad, very finely punctured; legs reddish-brown, with femora darker. L. $3-4\frac{1}{2}$ mm.

Male with the three frontal tubercles obsolete, and the metasternum impressed; in the female the forehead is almost smooth, and the elytra are a little dilated behind.

In dung, especially sheep's dung; rare, but occasionally found in some numbers where it occurs; Bewdley Forest (Blatch); Tintwistle and Greenfield, Yorkshire (Chappell); Northumberland district, rare (Bold); Scotland, very local, Clyde, Forth, and Tay districts.

A. putridus, Sturm *nec* Herbst. (*sedulus*, Har.). Oblong, almost obovate, convex, rather more strongly raised behind, black, shining, with the elytra pitchy or reddish with lighter red markings at base, shoulders, and before apex; the apex is rather dull; head finely punctured, palpi reddish-brown; antennæ reddish-brown with club sometimes darker; thorax slightly rounded at sides and narrowed in front, with the anterior angles obscurely reddish, thickly and finely punctured, the punctuation consisting of larger and smaller punctures intermingled; elytra with rather fine crenate striæ which become deeper towards apex, interstices very finely punctured; abdomen brown, reddish at apex legs brownish-red; the light-red markings on elytra are conspicuous in some specimens, but very obscure in others. L. $2\frac{1}{2}-3$ mm.

Male with the frontal tubercles stronger than in female, and the metasternum impressed.

In dung; local and, as a rule, not common; London district, not common, Mickleham, Esher, Ashted, Addington, Tonbridge; Eastbourne; New Forest; Northumberland and Durham district; Scotland, local, in sheep's dung, Forth, Tay, and Dee districts; Ireland, Newcastle, co. Down (Champion).

A. nemoralis, Er. Obovate, convex, but somewhat depressed on disc, considerably widened behind, black, very shining; head very thickly punctured, antennæ and palpi reddish-brown, the latter with blackish club; thorax rather finely and thickly punctured, much more thickly at sides which are almost straight; scutellum moderate, punctured at base; elytra often brownish or obscurely brownish-red at base with rather fine crenate striæ, and with the interstices, especially at the sides, plainly punctured; legs black, or reddish-brown with femora darker, tarsi ferruginous. L. $4-4\frac{1}{2}$ mm.

Male with the frontal tubercles more distinct, the thorax somewhat

broader and more diffusely punctured on disc, and the metasternum impressed.

In sheep's or deer's dung in woods; rare; Scotland, Tay and Dee districts (Braemar, Aviemore, &c.). Erichson records it as not rare in the Thüringer Walde in deer's dung.

A. plagiatus, L. Elongate, narrow, convex, subcylindrical, shining black with a very slight æneous reflection; head finely and more or less thickly punctured, with the frontal tubercles almost absent; the central one, however, is plainly traceable; antennæ brown with blackish club; thorax with sides almost straight, very finely punctured, with large punctures intermingled; these are diffuse on disc, but much thicker at sides; scutellum punctured at base; elytra either entirely black, or with a large oblique red patch on disc of each, with fine crenate striæ, interstices large and flat scarcely visibly punctured; legs variable, either black with tarsi ferruginous, or reddish-brown with blackish femora, or entirely reddish-brown. L. $2\frac{1}{2}$ –3 mm.

Male with the metasternum slightly impressed in middle and pubescent.

Damp places; under stones, in flood refuse, &c.; rarely in dung; local, but not uncommon where it occurs; Deal; Sheerness; Dover; Hastings; Barmouth; Wisbeach; Peterborough; Norwich; Liverpool: the form with immaculate elytra appears to be the commonest; this was introduced by Mr. Crotch (Proc. Ent. Soc. London, Nov. 19, 1866) as *A. niger*, Gyll.; that species, however, does not appear to have been hitherto found in Britain; it is closely allied to *A. plagiatus*, but is rather larger, and has no æneous reflection (this, however, is often scarcely visible in *A. plagiatus*); the posterior tarsi, moreover, have the exterior spur shorter, and the metasternum is more finely and sparingly punctured, and not pubescent in the male.

A. lividus, Ol. Oblong, convex, shining, of a livid testaceous colour, with the base of the head, the disc of thorax, and the suture of elytra, together with a more or less broad and cloudy band on each of the latter, dark; as a rule the dark band covers the greater part of the elytra, leaving the apex, margin, and a line before suture light; head finely punctured, rugose in front, antennæ and palpi testaceous; thorax extremely finely punctured with fine and scattered larger punctures which are more numerous at sides; elytra with rather fine but distinctly crenate striæ, interstices exceedingly finely punctured; legs short and stout, reddish-brown with femora yellow. L. $3\frac{1}{4}$ – $4\frac{1}{2}$ mm.

Male with central frontal tubercle larger, and the metasternum impressed in the middle.

In dung, manure heaps, &c.; very local; London district, not uncommon, Norwood, Lee, Darenth Wood, Sittingbourne, Greenwich, Forest Hill; Kingsgate, near Margate, in abundance (T. Wood); Holy Island; Northumberland district, rare, Heaton and Long Benton.

A. porcus, F. Oblong, rather depressed, black, dull, with the elytra of a dark red colour; head comparatively small, very thickly punctured, antennæ yellow with greyish club, palpi reddish-yellow;

thorax thickly and regularly punctured with the interstices finely shagreened, and with a more or less distinct smooth central line; scutellum with coarse punctures; elytra with strong striæ which are feebly crenate, with two depressed and channelled, very finely setose, and furnished interstices rows of rugose punctures which are not, as a rule, distinctly marked; legs brownish-red, usually with the femora dark brown or blackish. L. 4-5 mm.

Male with the frontal tubercle obsolete, the prothorax slightly shiny and the metasternum impressed; female with the central frontal tubercle stronger,* and the thorax duller.

In dung; local and, as a rule, not common, but sometimes abundant where it occurs; London district, not common, Mickleham, Box Hill, Richmond, Addington; St. Peter's; Kingsgate; Ramsgate; Ventnor, Isle of Wight; Bath; Swansea; Sutton Park, Birmingham; Scotland, rare, Solway and Forth districts; Ireland, near Belfast.

A. scrofa, F. A very small species; oblong oval, rather depressed, black, dull, clothed with greyish pubescence; head sparingly punctured behind, finely punctured in front, antennæ and palpi brown, the latter with blackish club; thorax regularly and rather thickly punctured, often reddish-brown at sides; elytra with strong crenate striæ, and the interstices with two rows of granulations; sides and apex pitchy; legs reddish-brown. L. 2-3 mm.

Male with the clypeus even and impunctate, and the metasternum impressed in middle, female with the clypeus slightly convex and punctured.

In dung; extremely rare as British; Pentire Point, Cornwall (Stephens); Southport (Sidebotham); it is not an uncommon species in Central Europe.

A. tristis, Panz. Rather short and broad, moderately convex, shining black, sides of thorax and the elytra rarely pitchy; head thickly punctured, frontal tubercles obsolete, antennæ yellowish-brown with blackish club, palpi brown; thorax rather thickly punctured, the punctuation consisting of larger and smaller punctures intermingled; scutellum rather depressed, with trace of a raised central line; elytra somewhat widened behind, with strong crenate striæ, interstices finely punctured, either entirely black, or pitchy, or black with obscure reddish markings at shoulder and before apex; legs blackish or reddish brown; posterior tarsi short, with the first joint of tarsi dilated in both sexes, and shorter than the spurs of the tibiæ. L. 3-4½ mm.

Male with the posterior tarsi somewhat dilated and pilose on their inner side.

Sandy places; in dung; not uncommon where it occurs, but very local; Esher,

* I give this fact on the authority of Thomson (Skand. Col. vi. 57); it is, however, if correct, contrary to the usual order of things, and I should be inclined to assign the stronger tubercle to the male. I have never seen the species alive.

Wimbledon, Leith Hill, Whitstable; New Forest; Bristol; Swansea; Sutton Park, Birmingham.

A. pusillus, Herbst. (*cænosus*, Ahr.). Oblong, slightly broader, as a rule, behind, moderately convex, black, shining, with the anterior angles of thorax reddish, and the apex of elytra and sometimes a patch before apex reddish-brown; occasionally the sides of thorax and the whole elytra are reddish; head thickly and finely punctured, frontal tubercles obsolete, antennæ reddish-brown with dark brown club, palpi dark brown; thorax black, with the anterior angles reddish, rather thickly punctured, the punctuation consisting of larger and smaller punctures intermingled, the former being sparing on disc and more numerous at sides; scutellum very finely punctured; elytra strongly crenate-striate, the striæ becoming deeper behind, interstices exceedingly finely punctured; legs pitchy or reddish brown. L. $2\frac{1}{2}$ – $3\frac{3}{4}$ mm

Male with the metasternum impressed, and the thorax broader than in female.

In dung, haystack refuse, &c.; somewhat local, but by no means uncommon; London district, generally distributed and common; Pegwell Bay; Dover; Folkestone; Hastings; Brighton; Devon; Burnham, Somerset; Bath; Sutton Park, Birmingham; Wallasey, Cheshire; Northumberland and Durham district; Scotland, not rare, Solway, Forth, Tay, and probably other districts; Ireland, near Belfast.

This species is related to *A. granarius*, but is evidently smaller and narrower, and has the thorax much more closely punctured.

A. quadrimaculatus, L. (*4-pustulatus*, F.). Oblong, moderately convex, black, shining, each elytron with two well-marked and distinct large yellowish-red spots on each, one at shoulder and another before apex; head rather thickly and finely punctured, with frontal tubercles obsolete, palpi black, antennæ brown with black club; thorax thickly punctured, the punctuation consisting of larger and smaller punctures intermingled, unicolorous black; scutellum finely punctured at base; elytra with distinct crenate striæ, interstices broad and flat and extremely finely punctured; legs black with tarsi reddish, or entirely brown or reddish-brown. L. $2\frac{1}{2}$ – $3\frac{1}{4}$ mm.

Male with the metasternum impressed, and the spur of the anterior tibiæ obtuse at apex, female with the metasternum even and the spur of the anterior tibiæ acuminate.

In dung; rare; Red Hill, Reigate, Coombe Wood; Windsor; Bristol; Swansea; Norfolk; Scotland, Edinburgh (Stephens); it has not, however, been recorded by Dr. Sharp.

A. merdarius, F. Oblong, not very convex, head and thorax shining black, the latter with the anterior angles, and the side margins as a rule more or less narrowly, yellowish-red; elytra testaceous with the suture rather broadly black; head finely punctured, with frontal tubercles very obsolete or wanting; antennæ and palpi brown, the former with blackish club; thorax very finely punctured with an inter-

mixture of fine but larger punctures; scutellum finely punctured at base; elytra with crenate striæ, interstices finely punctured, rather more thickly so at sides than on disc; legs blackish-brown, brownish, or yellowish-brown. L. 3–4 mm.

Male with the metasternum impressed in middle and the spur of the anterior tibiæ curved; in the female the metasternum is simple, and the spur of the anterior tibiæ is straight.

In dung; common and generally distributed throughout the kingdom.

A. inquinatus, F. Oblong, convex, shining, black, with the anterior angles of thorax usually pitchy red, and the elytra of a dirty-testaceous colour, with dark patches longitudinally arranged near suture and a more or less irregular dark band before sides, which is occasionally obscure; head rugose in front, antennæ and palpi blackish-brown, the former with the club darker; thorax finely punctured with larger punctures intermingled which are more numerous at sides; scutellum diffusely punctured; elytra with shallow crenate striæ, extremely finely pubescent; legs reddish-brown with the under-side of the femora lighter. L. $3\frac{1}{2}$ – $5\frac{1}{2}$ mm.

Male with the intermediate frontal tubercle more strongly marked, and the disc of thorax less closely punctured than in female; the metasternum also is slightly impressed and clothed with greyish pubescence.

In dung; somewhat local, but generally distributed and as a rule common throughout the greater part of England; rarer, however, further north; Scotland, local, Tweed and Forth districts; it is probably common in parts of Ireland.

(**A. melanostictus**, Schmidt. Very closely allied to the preceding, but, as a rule, much larger, with the ground colour of the elytra of a darker testaceous colour and the legs more developed, and usually lighter; the latter point, however, appears to be variable; the sides of the thorax are entirely reddish-testaceous, and the anterior black marking in the second interstice of the elytra is situated in or about the middle, whereas in *A. inquinatus* it is always before the middle; the dark markings, however, in these species of *Aphodius*, are often very irregular. L. 3–7 mm. ($1\frac{1}{2}$ – $3\frac{1}{2}$ lin., Erichson).

Apparently very local and rare in Britain; it was introduced by Mr. Rye on specimens from the Manchester district (Ent. Monthly Mag. xv. 280); Wallasey, Cheshire, and Crosby near Liverpool (rare, resembling suffused specimens of *A. inquinatus*, Ellis); Withington, Cheshire (Chappell.)

(I inserted this species on the authority of Mr. Rye, but felt somewhat doubtful about it, as specimens sent me by Mr. Chappell did not appear to agree with Mr. Rye's description; I am, however, now strongly of opinion that the specimens on which the species has been introduced are merely forms of *A. inquinatus*, and I am led to this belief through the paper by Dr. Ellis, published, since I wrote the above description, in the Entomological Society's Transactions, xv., 1888, in which he fully discusses the question; the chief distinguishing character, as he points out, lies in the male, which in *melanostictus* has the metasternal plate extremely finely punctured and

completely destitute of hair, whereas in *inquinatus* it is thickly and deeply punctured and distinctly hairy, and he goes on to say that on submitting his specimens of the (so-called) *melanostictus* and those of Mr. Chappell to a careful examination, they all agreed with the males of *inquinatus* in the latter character; as the character of the elytral markings is by no means a dependable one, the species and its allies being very variable in this respect, it seems most probable that *A. melanostictus* has been wrongly recorded as British; I have, however, preferred to retain it in brackets, as it is possible that it may be in some collections.)

A. tessulatus, Payk. Of shorter and broader form than the preceding species, and with the dark markings of the elytra more confluent, and, as a rule, covering a larger part of the elytra; head and thorax shining black, elytra testaceous or fusco-testaceous with variable dark markings, which sometimes take the form of transverse waved bands, and sometimes of more or less confluent longitudinal patches; head rugose in front, antennæ brown with blackish club, palpi blackish-brown; thorax with the sides more or less obscurely pitchy or pitchy red, or with the anterior angles reddish, or entirely black, very finely punctured with larger punctures intermingled; scutellum rather broad, finely and sparingly punctured at base, elytra with shallow crenate striæ, interstices exceedingly finely punctured, quite glabrous; legs brown or reddish pitchy brown, with the tarsi, and sometimes the tibiæ, lighter. L. $3\frac{1}{2}$ – $4\frac{1}{2}$ mm.

Male with the thorax broader, more convex and more sparingly punctured on disc than in female, and with the central frontal tubercle more distinct.

In dung, local and, as a rule, not common; Mickleham, Woking, Chatham, Chobham, Hainault Forest, Tonbridge Wells; Broadstairs (common in late autumn, T. Wood); Folkestone; Deal; Swansea; Sutton Park, Birmingham; Hartlepool; Scotland, very local, Forth district; Ireland, Portrush, co. Antrim (Rev. W. F. Johnson).

A. conspurcatus, L. Oblong, convex, shining; head black with a reddish spot on each side, rugose in front; antennæ brownish-yellow with dark club, palpi black or dark brown; thorax with the sides, and often the base, reddish-testaceous, finely punctured with an intermixture of larger punctures; scutellum rather broad, punctured; elytra with punctured striæ, testaceous, with seven rather small and distinct dark markings on each, two in the second interstice, one in the third, two in the fourth (one of which is close to base), and two in the sixth; the interstices are very finely punctured; legs clear brownish-red, with the femora yellow on their under-side. L. 4–5 mm.

Male with the thorax broader and more sparingly punctured on disc than in female, and with the central frontal tubercle more distinct.

In dung; very local; Loughton, Essex; Woodford; Hainault Forest; New Forest; Swansea; Wallasey, Cheshire; Northumberland and Durham district; Scotland, very rare, Forth and Tay districts.

A. sticticus, Panz. Allied to *A. inquinatus*, but duller, and with

the striæ of the elytra stronger, and the sides of thorax, and not merely the anterior angles, testaceous; the head also has a reddish spot on each side near eyes, and the markings of the elytra are much more confluent behind and more longitudinal, ordinarily presenting the appearance of a rough longitudinal network at sides and apex, a broad space around scutellum being left immaculate; as, however, in other allied species, these markings are variable; head distinctly but finely punctured, more closely in front; antennæ and palpi yellow, the former with brownish club; thorax finely punctured, with an intermixture of larger punctures; scutellum brown, with a yellow spot in centre, punctured at base; elytra with rather deep crenate striæ, interstices finely punctured; legs clear brownish-red, with the femora yellow, at least beneath. L. 3-5 mm.

Male with the thorax broader and more sparingly punctured than in female, and the metasternum impressed; the clypeus is obsoletely tuberculate in both sexes.

In dung; very local, but sometimes not uncommon where it occurs; Darenth Wood, Shirley, Ripley, Ashted, Box Hill, Chingford, Tonbridge, Belvedere; Glanvilles Wootton; New Forest; Bath (local, September, R. Gillo); Llangollen. Stephens records it from Edinburgh, but this would appear to be in error.

A. consputus, Cr. (*Melinopterus consputus*, Muls.). Oblong, not very convex, shining; head black with two well-marked spots above eyes testaceous, diffusely punctured behind, more closely in front; antennæ brownish-yellow with club blackish, palpi brown; thorax rather broadly testaceous at sides, and sometimes narrowly behind; the anterior margin is also very narrowly yellowish; upper surface more or less thickly and finely punctured with an intermixture of larger punctures; elytra livid testaceous with apex, sides, and suture, and sometimes a small spot on each before apex light testaceous or light testaceous with a longitudinal livid band on each, varying in breadth and more or less cloudy, with fine, but distinctly crenate or rather punctured striæ, interstices finely punctured, but more plainly than in some of the preceding species; legs testaceous, with the femora on their inner side sometimes blackish. L. 3-4½ mm.

Male with the thorax broader and much more finely and sparingly punctured on disc than in female, in which sex the larger punctures are sometimes set close together on disc, and cause it to appear rather strongly and closely punctured; in the male the metasternum is impressed.

In dung; rare; Gravesend (Champion); Sheppey (Walker); Broadstairs (T. Wood, fifteen specimens in late autumn); Ashford, Kent (T. H. Hart); Bushey Park (Lowe).

A. punctato-sulcatus, Sturm (*sabulicola*, Thoms.; *Melinopterus punctato-sulcatus*, Muls.). Head and thorax black, shining, the latter with margins testaceous; elytra of a more or less distinct livid-testaceous colour with a broad, more or less cloudy, fuscous band on disc of each; head with indistinct traces of frontal tubercles, finely and sparingly

punctured behind, rugose in front, antennæ yellow with blackish club, palpi black; thorax extremely finely punctured with large punctures intermingled, which in the male are very sparing on disc and thicker at base and sides, and in the female are more thickly scattered throughout; scutellum rather large, almost smooth behind; elytra with rather shallow crenate striæ, interstices finely punctured; legs brownish-testaceous. L. 4–6 mm.

Male shorter, subdepressed, elytra clothed with grey pubescence, metasternum with a glabrous impression; female oblong, subcylindrical, elytra very finely pubescent at apex.

In dung; common and generally distributed throughout the kingdom; one of the commonest of our species of *Aphodius*.

A. prodromus, Brahm. (♀ *sphacelatus*, Panz.; *Melinopterus prodromus*, Muls.). Very closely allied to the preceding in colour and general appearance, but differs in the following particulars: average size larger; head longer without a trace, or scarcely a visible trace of frontal tubercles; disc of thorax in male almost impunctate; sides of thorax, as a rule, rather more broadly testaceous; elytra with the interstices finely and thickly punctured on each side, with the space between almost smooth; the spur of the anterior tibiæ is blunt at apex in male and pointed in female, whereas in *A. punctato-sulcatus* it is sharp in both sexes; one of the best characters appears to be in the sculpture of the elytra. L. $4\frac{1}{2}$ –7 mm.

In dung; not so abundant as the preceding, but common and generally distributed throughout the kingdom.

A. contaminatus, Herbst. Oblong, convex, somewhat depressed on disc, head and thorax black with an æneous reflection, very shining, anterior angles and usually sides of latter of a reddish or yellowish-pitchy colour; antennæ black with the two first joints brownish-yellow, palpi yellow with last or last two joints brown; elytra of an obscure dirty-testaceous colour, strongly pubescent, with fuscous markings, which are somewhat irregular, but usually take the form of longitudinal patches, more or less confluent, on the interstices; head flat with frontal tubercles obsolete, distinctly punctured, reddish in front in most cases; thorax suborbicular, only a little shorter than broad, with the disc sparingly and finely, and the sides more thickly and strongly, punctured, and the sides set with long outstanding hairs (a character that will easily distinguish the species); scutellum smooth; elytra with rather distinct punctured striæ, interstices rather plainly punctured, especially at sides; legs yellowish-brown or brownish-testaceous with knees darker. L. $5-6\frac{1}{2}$ mm.

Male with the thorax larger, the elytra more strongly pubescent, and the metasternum slightly impressed in middle; anterior tibiæ with apical spur rather stout and obliquely truncate at apex.

In dung; generally distributed throughout the kingdom, and usually common; it

was, however, decidedly scarce at Repton, near Burton-on-Trent,* and is probably somewhat local; it is sometimes exceedingly abundant and swarms on the Malvern Hills and in many other localities, being exceedingly fond of hovering over and settling near dung on the roads and pathways in the sunshine.

A. obliteratus, Panz. (*Melinopterus obliteratus*, Muls.). Closely allied to the preceding, but easily distinguished by the absence of long outstanding hairs at sides of thorax, and by the more obscure dark markings on elytra; oblong, convex, head and thorax shining black, the former reddish in front and the latter with anterior angles and often all the side margins yellowish; antennæ blackish, with the first two joints yellow, palpi reddish-brown, often darker at apex; thorax finely punctured, much more sparingly in male than in female; scutellum smooth; elytra finely pubescent, with punctured striæ, interstices finely punctured, of a dirty-testaceous colour with more or less obscure cloudy dark markings; legs testaceous, with knees darker. L. 4–5 mm.

Male with the thorax larger and the pubescence of elytra longer, and the metasternum impressed; the apical spur of the anterior tibiæ is also thicker.

In dung; local, but not uncommon where it occurs; Birch Wood, Darenth Wood, Caterham, Mickleham, Addington, Tonbridge; Amberley; Hastings; Isle of Wight; Bath; Needwood Forest, Staffordshire; Liverpool district; Scotland, rare, Tweed and Forth districts; Ireland, Armagh, rare (Rev. W. F. Johnson).

A. Zenkeri, Germ. Rather short, oblong, ferruginous with the head and thorax dark on disc and with more or less obscure dark markings before apex of elytra; the head and thorax are sometimes almost entirely dark with red margins, and sometimes entirely reddish; antennæ and palpi reddish or ferruginous with club of the former sometimes a little darker; head with frontal tubercles, thickly punctured, rugose in front; thorax very thickly punctured, the punctuation consisting of larger and smaller punctures intermingled; scutellum finely punctured; elytra with broad, flat, and rather shallow crenate striæ, the interstices being smooth and feebly carinate in middle, and depressed and finely punctured on each side; legs clear ferruginous or brownish-red. L. $3\frac{1}{2}$ –4 mm.

Male with the central frontal tubercle more strongly marked, the thorax broader, and the metasternum impressed in middle.

In dung; very local and usually rare; Mickleham; Sevenoaks; Addington; Llangollen; Withington, Cheshire; Bretby Park, Derby (Harris, August 1887); the species was first detected as British by Dr. Power, who found it at Mickleham.

A. luridus, F. (*Acrossus luridus*, Muls.). Oblong-oval, rather depressed, moderately shining; antennæ and palpi black; head and thorax black, the former flat, without tubercles, finely punctured, semi-

* During the several years that I worked this neighbourhood I never remember to have met with a specimen, and my friend the late Mr. W. Garneys records it as scarce in the district; in fact I used to regard it as one of the better species.

circular, with strongly raised front margin; thorax rather thickly and finely punctured, the punctuation consisting of large and small punctures intermingled; elytra with fine and finely crenate striæ, interstices flat, rather finely but distinctly punctured in irregular rows, colour very variable, lurid-testaceous with dark, more or less longitudinal, markings, sometimes entirely black, and occasionally simply testaceous with the striæ dark; between these two extremes every variety occurs; legs black with tarsi ferruginous, or pitchy, or sometimes entirely reddish. L. 6–9 mm.

Male with the spur of the anterior tibiæ obtuse at apex and somewhat inflexed; in the female it is acuminate.

In dung; generally distributed throughout the greater part of the kingdom, but somewhat local in certain districts; the black variety is rather uncommon.

A. rufipes, L. (*capitatus*, De G.; *Acrossus rufipes*, Muls.). Elongate, oblong, subparallel, moderately convex, almost subcylindrical, pitchy black, or pitchy reddish-brown, with the forehead and middle of thorax often darker, and the front of head and sides of thorax lighter; antennæ and palpi clear ferruginous or reddish-brown; head flat, very finely punctured, semicircular in front with distinct raised margin; thorax exceedingly finely punctured, almost smooth on disc, with larger punctures at sides and anterior angles; scutellum smooth; elytra long, scarcely dilated behind, with distinct, but rather feebly crenate striæ, interstices flat, extremely finely punctured; under-side and legs reddish or reddish-brown. L. 10–12 mm.

Male with the metasternum slightly impressed in middle, and the forehead even; female with the frontal suture distinct, and with the clypeus obsoletely raised in middle.

In dung; common and generally distributed throughout the kingdom.

A. depressus, Kug. (*nigripes*, Gyll.; *atramentarius*, Er.; *Acrossus depressus*, Muls.). Oblong oval, moderately convex, but somewhat depressed on disc, shining black, unicolorous, or with the elytra bright red; head flat, finely punctured, semicircular in front, with distinct raised margin, antennæ black, palpi clear red; thorax finely but distinctly punctured, the punctuation consisting of larger and smaller punctures intermingled; scutellum punctured at base; elytra somewhat dilated at sides, with finely crenate striæ, interstices flat, comparatively distinctly punctured; legs black with tarsi ferruginous. L. 6–8 mm.

Male with the forehead even, and the thorax larger and more finely punctured than in female; in the latter sex there is a trace of the central frontal tubercle, which perhaps confirms Thomson's observations regarding *A. porcus* (see page 26).

In dung; somewhat local, but widely distributed throughout the kingdom as far north as the Orkney Islands; the form with red elytra is the typical form, and appears to be very rare as British.

PLAGIOGONUS, Mulsant.

This genus contains three or four species from Europe, Algeria, and Syria; they differ from *Aphodius* in having the sutural angles of the elytra produced into a tooth at apex, and perhaps ought not to be separated from that genus, as the differences are very slight.

P. arenarius, Ol. (*rhododactylus*, Marsh.). The smallest of our species belonging to the *Aphodiina*; rather elongate, moderately convex, very shining, black or pitchy black, occasionally brownish; antennæ and palpi reddish, the former with a large blackish or brownish club; head large, very finely punctured, clypeus large separated from head by a very fine and distinct line; thorax slightly narrower than elytra, almost straight at sides, with the posterior angles emarginate, rather sparingly and strongly punctured, with an intermixture of finer punctures; elytra usually a little lighter than thorax, somewhat widened behind middle, sutural angles toothed at apex, with fine striæ which become much stronger and sulcate towards apex, interstices sparingly and very finely punctured; legs reddish-brown or pitchy. L. 2-2½ mm.

In the male the clypeus is almost even and obsolete punctured in middle; in the female it is evenly punctured and somewhat raised in middle.

Chalky and sandy districts; in dung; occasionally by sweeping; local; Chatham, Caterham; Amberley; Riddlesdown; Shipley, near Horsham; Eastbourne; Swansea; Newmarket Heath. It is sometimes rather plentiful where it occurs.

HEPTAULACUS, Mulsant.

The members of this genus are often included under the genus *Oxyomus*, which in its widest sense includes about a dozen species, of which six are European, and the remainder have been recorded from South Africa, Tahiti, and Chili; they are easily known from *Aphodius* by having the interstices of the elytra more or less carinate.

- I. Thorax shiny, rather diffusely and not strongly punctured; elytra yellow with the second and fourth interstices marked with black *H. sus*, *Herbst*.
- II. Thorax dull, strongly, very closely, and more or less rugosely punctured; elytra pitchy black or reddish with round yellowish-red spots *H. testudinarius*, *F.*
- III. Thorax rather shiny, somewhat closely but not rugosely and only moderately strongly punctured; elytra unicolorous reddish *H. villosus*, *Gyll.*

H. sus, *Herbst*. Somewhat elongate, subparallel, pubescent; head and thorax reddish-brown, the latter with margins lighter; the anterior margin of the clypeus is also broadly lighter; elytra obscurely testaceous with the second and fourth interstices mottled with black; head sparingly punctured, antennæ and palpi reddish-yellow; thorax a little broader than long, diffusely and not strongly punctured, more diffusely on disc, more thickly however in female than in

male, with long and rather thick setæ at sides; elytra with six raised longitudinal lines on each, the spaces between these being rather broad and very finely punctured, sides set with thick and long hairs; legs yellowish-brown with femora yellow, posterior tarsi elongate. L. $3-4\frac{2}{3}$ mm.

In the male the thorax is a little broader than in the female, and is more diffusely punctured on disc, and the clypeus is more even.

Sandy places, in dung; very local, but not uncommon where it occurs. Deal; Hastings; Sandwich; Chesil Bank; Dartmoor, Devon; Burnham, Somerset; Swansea; Norwich; Wallasey, Cheshire (one specimen, Wilding); it is recorded in Stephens' Illustrations (Mand. iii. 208) as "taken most abundantly by J. Rawlins, Esq., in a field by Rivelstone Wood, near Edinburgh," but Dr. Sharp considers that the record is erroneous.

H. testudinarius, F. Smaller than the preceding, finely pubescent, of a dull black colour, with the elytra black or pitchy, and marked with rather large and irregular round yellowish-red spots; head large, with clypeus somewhat raised in middle in both sexes, and emarginate at apex, thickly sculptured; antennæ and palpi brownish-red, the former with a very large blackish club; thorax transverse, very thickly and strongly punctured, the punctures being large and more or less confluent towards sides; elytra with six raised lines on each, the spaces between being broad and very obsoletely punctured; legs reddish-brown. L. $2\frac{1}{2}-4$ mm.

Male as a rule much smaller than the female, and with the spurs of the anterior tibiæ curved at apex; in the female the latter are simple and pointed.

Sandy places, in dung; very local, and not common; Woking, Bagshot, Esher, Chobham, Hampstead Heath, Bow, Coombe Wood; Swansea; Sandburn Wood, York (Hey).

H. villosus, Gyll. Of about the same size on the average as the preceding, but more shining, and with the thorax less closely and more finely punctured; the general colour is reddish-brown with the thorax darker, and the anterior portion of head and some more or less indistinct and cloudy markings on elytra lighter; antennæ and legs reddish-testaceous, the club of the former small; thorax transverse, rather thickly punctured; elytra with six raised lines on each, which, however, are less sharp and much less strongly marked than in the preceding species; posterior tarsi comparatively short. L. 3-4 mm.

The male is as a rule smaller than the female, but the other sexual differences are slight.

Sandy and chalky places; very rare; Mickleham (where it has been captured by Mr. Champion and Mr. Marsh by beating hazel); Freshwater, Isle of Wight (Waterhouse); it has also been taken recently (June 1887) in the island by Mr. Champion; Newmarket Heath (Stephens); Llandudno (Sidebotham); Southport (one specimen taken on June 19th, 1858, by Mr. B. Cooke).

OXYOMUS, Laporte.

The single British species belonging to this genus in its restricted sense may be easily known by its small size and unicolorous black colour, and also by the broad longitudinal furrow at the base of thorax, and the strongly sculptured furrows and interstices of elytra; it is often found in hotbeds in certain localities.

O. porcatus, F. (*sylvestris*, Scop.). Black or fuscous black, dull, rather elongate and subparallel, with the upper surface somewhat depressed; head large, finely and sparingly punctured, antennæ and palpi reddish-testaceous; thorax as broad as elytra with sides almost straight, anterior margin reddish, upper surface strongly and unevenly punctured, with a broad furrow reaching from about middle to base; elytra with ten strong furrows set with large strong punctures, the interstices being carinate, and the punctures divided by transverse lines; apex of abdomen and legs reddish-brown. L. $2-2\frac{1}{2}$ mm.

In the male the metasternum has a shallow longitudinal impression in the middle.

In vegetable refuse, cut grass, dung-heaps, &c.; often in hotbeds; local; London district, not uncommon; Hastings; Shirley Warren, Southampton; Bath; Swansea; Norfolk; Wicken Fen, Cambridge; Cheshire; Repton, Burton-on-Trent; Lincoln; Scarborough; New Brighton; Crosby, near Liverpool; it has not apparently been recorded from the extreme northern counties of England or from Scotland.

AMMŒCIUS, Mulsant.

This genus contains about sixteen species, of which twelve are found in Europe, and two have been described from the Cape of Good Hope; they are distinguished from *Aphodius* by the fact that the eyes are entirely concealed when the head is retracted, and from *Rhyssenus* and *Psammobius* by not having the thorax transversely costate or sulcate; only one species is found in Britain.

A. brevis, Er. (*elevatus*, Panz., nec Ol.). Obovate, short and broad, considerably dilated behind, very convex, shining black, head large, broadly emarginate in front, finely punctured behind, clypeus somewhat rugose, antennæ and palpi red; thorax rather narrower than elytra, somewhat narrowed in front, with large and coarse scattered punctures which are usually thicker at base and sides; scutellum rather large; elytra only double as long as thorax, very convex, raised behind, with very strong crenate striæ, which become deeper behind, interstices smooth; legs pitch-black with tarsi ferruginous, posterior tarsi with the exterior spur longer than the first joint of the tarsus. L. $3\frac{1}{2}-4\frac{1}{2}$ mm.

Male with the metasternum slightly impressed in middle.

In partly dry cow-dung; very local; first taken by Mr. Haward, in May 1859, on the sand-hills at Southport, Lancashire, and afterwards found abundantly in the same locality; it has, I believe, also occurred in one or two neighbouring localities.

RHYSSEMUS, Mulsant.

This genus contains about fifteen species, of which eight occur in Europe, and the rest have been recorded from North America, Ceylon, North Africa, Madagascar, &c.; they are very closely allied to *Psammobius*, but are distinguished by the structure of the hind tarsi and the granulation of the interstices of the elytra; as in the last-mentioned genus, the head is asperate, and the thorax sulcate.

R. germanus, L. (*Psammobius asper*, Steph.). About the size of *Oxyomus porcatus*, and of the same shape, fuscous black, dull, antennæ and palpi reddish-yellow; head thickly and finely granulate; thorax short, convex, with four or five transverse furrows, dividing four transverse elevated costæ, the two posterior of which are sinuated and interrupted in middle; elytra elongate, punctate-striate, with the interstices granulate in two rows; legs reddish-brown. L. 2-2½ mm.

Male with the metasternum impressed with a deep roundish impression in middle.

Under rotting vegetable matter, and at roots of decaying plants; very rare, and doubtful as British; sandy coasts near Bristol (Stephens); said by Curtis to have been taken near Swansea; I know of no recent captures.

PSAMMOBIUS, Heer.

This genus contains about five-and-twenty species, of which fifteen are found in Europe; the others are widely distributed, species having been recorded from North and South Africa, Arabia, Ceylon, Java, Cuba, North America, &c.; they are distinguished from all our other allied genera except *Rhyssemus* by their deeply and transversely sulcate thorax.

- I. Thorax without lateral or basal setæ; first joint of posterior tarsi longer than exterior apical spur of tibiæ; tarsi longer, with claws of the usual size *P. CÆSUS, Panz.*
- II. Thorax with a fringe of clavate setæ at base and sides; first joint of posterior tarsi shorter than exterior apical spur of tibiæ; tarsi shorter, with claws small and weak.
 - i. Size smaller and narrower; striæ of elytra rather finely punctured *P. SULCICOLLIS, Ill.*
 - ii. Size larger and broader, striæ of elytra broader and more coarsely punctured *P. PORCICOLLIS, Ill.*

P. cæsus, Panz. (*Pleurophorus cæsus*, Muls.). Elongate, narrow, subcylindrical, parallel-sided, pitchy black, shining, with the antennæ reddish; head thickly wrinkled and granulate; thorax as broad as elytra, not narrowed in front, sparingly and very strongly punctured, with a fine central furrow, abbreviated in front, and two feeble transverse furrows on each side, one just behind the anterior margin and the other in the middle; elytra with strong and crenate striæ, interstices flat and

smooth; legs short, ferruginous, with the posterior tarsi slender, and not very short, claws of the usual size. L. $2\frac{1}{2}$ –3 mm.

Under stones and on the wing; extremely rare, and somewhat doubtful as British; Stephens (Illustr. iii. 211) refers to it as "a rare species, at least towards the eastern parts of Britain; in the western it appears to be more abundant. 'Near Bristol and Pentire Point, Cornwall,' Dr. Leach:" I know of no recent capture.

P. sulcicollis, Ill. Obovate, convex, strongly sculptured, brownish-black, brown or reddish-brown, rather shining, antennæ reddish-yellow or ferruginous; head reddish on anterior margin, granulate in front and with oblique ridges behind; thorax somewhat narrower than elytra with four deep transverse furrows, base and sides set with short clavate setæ; elytra with strong and deep striæ, which are crenate or punctured at their base, but not very evidently so; legs brownish-red, tarsi short with small and feeble claws. L. $2\frac{1}{2}$ –3 mm.

Male with the metasternum slightly impressed in middle; some specimens appear to be considerably more dilated behind middle than others, but I do not know whether this is a sexual difference.

Sandy places on the coast, in and on the sand; occasionally under seaweed; local and not common; Deal; Dover; Westward Ho! North Devon; Burnham, Somerset; Bristol; Weston-super-Mare; Swansea; Norfolk; Scarborough; Crosby, near Liverpool; Southport, Lancashire; Scotland, extremely local, Tay district.

Dr. Sharp (Scottish Nat. iv. 179) says of it, "This is a maritime species, but occurs in a sandy place on the banks of the Tay above Perth." Mr. W. Garneys has recorded it from Repton, near Burton-on-Trent, in hotbeds, but I think he must have made some mistake regarding it.

P. porcicollis, Ill. Larger and broader than the preceding, which it closely resembles; it may easily be known by the much broader and more coarsely crenate striæ of the elytra; the thorax is more ample, and there are scarcely any traces of the oblique ridges at the back of the head which are evident in *P. sulcicollis*. L. 3 – $3\frac{3}{4}$ mm.

Sandy places, beneath the surface of the sand, under small stones, and also at the roots of stunted or low herbage (such as *Ononis*); very rare; a few specimens have been taken at Whitsand Bay, four miles from Devonport, by Mr. J. J. Walker; one specimen was known previously, which was found in Mr. Kirby's collection mixed with *P. sulcicollis*.

ÆGIALIA, Latreille.

This genus contains about a dozen species, of which three occur in Europe; all of these are found in Britain; the other species have been described from Northern Asia, North America, and Egypt; they are distinguished from all the other Aphodiina by having the mandibles visible beyond the clypeus.

I. Thorax punctured or almost smooth; colour, as a rule, black, or dark pitchy-brown.

i. Thorax very coarsely punctured; posterior legs not thickened *Æ. SABULETI*, Payk.

- ii. Thorax very finely punctured, almost smooth ; posterior legs thickened *Æ. ARENARIA, F.*
 II. Thorax strongly rugose ; colour always rufous ; posterior legs thickened *Æ. RUFA, F.*

Æ. sabuleti, Payk. Oblong, subparallel, black or pitchy black or brownish, not very shining, upper surface convex but with disc of elytra subdepressed ; head punctured behind, rugose or slightly granulate in front, antennæ and palpi red, maxillary palpi with the last joint slender and acuminate ; thorax about as broad as elytra, scarcely narrowed in front, very coarsely punctured, with the base sinuate on each side ; elytra with very strong crenate striæ ; legs ferruginous, or pitchy with tarsi lighter, posterior tibiæ narrow and only a little widened at apex, posterior tarsi rather long. L. $3-4\frac{1}{2}$ mm.

On the sandy banks of rivers and streams both near the coast and inland ; local ; it has not occurred, apparently, in the London district or the south of England ; Bristol ; Swansea ; banks of Usk ; Bewdley ; Matlock ; banks of Bollin, Cheshire ; banks of Irwell and Mersey ; Scarborough ; New Brighton ; Northumberland and Durham district ; Scotland, local, Solway, Forth, Tay, Dee, and Moray districts.

Æ. arenaria, F. (*globosa*, Kug.). Strongly ovate, very convex, somewhat globose, short and broad, of a shining black or reddish-brown colour, with long yellowish or brownish hairs at sides ; head convex, thickly granulate in front, antennæ yellowish-red ; thorax short, transverse, extremely finely and almost invisibly punctured, smooth ; elytra strongly convex and much dilated behind, with fine and rather feeble striæ, which are very obsoletely punctured, interstices broad and smooth ; legs ferruginous, posterior tarsi very short, tibiæ dilated. L. $4-4\frac{1}{2}$ mm.

Sandy coasts ; somewhat local in places, but apparently generally distributed around the coasts of the whole kingdom, and, as a rule, one of the commonest of the sand-hill beetles ; it is extremely sluggish in its movements ; immature specimens are often quite rufous, and in some collections have been made to do duty for *Æ. rufa*.

Æ. rufa, F. Oblong, rather elongate, subparallel and almost subcylindrical, elytra somewhat depressed on disc, colour entirely rufous or light ferruginous ; head rugose and finely and very thickly granulate, antennæ and palpi yellowish-red, last joint of maxillary palpi somewhat securiform ; thorax about as broad as elytra, somewhat narrowed in front, coarsely wrinkled, and finely punctured between the wrinkles ; elytra strongly striate, the striæ being feebly crenate or punctate at their base ; legs rufous, intermediate and posterior tibiæ darker at apex, and much dilated, tarsi short. L. $3\frac{1}{2}-4\frac{1}{2}$ mm.

On sandy coasts ; very local ; first taken by Mr. F. Archer in June 1862 at New Brighton, and for a long time considered one of our rarest British beetles ; it has, however, been recently taken in some numbers by Dr. Ellis, Mr. Wilding, and others at Wallasey (Cheshire), Liverpool, and New Brighton, and probably occurs in other localities in the Liverpool and Lancashire district.

The late Mr. Garneys had a specimen in his collection which, as far as I remember, he told me he captured at Barmouth, North Wales.

GEOTRUPINA.

The species belonging to this tribe are, as a rule, of large size and rounded convex form; in some species the males have the thorax, and sometimes the head, armed with horns and tubercles; the antennæ are 11-jointed, and terminate in a 3-jointed club, which is variable in form; the ventral segments are six in number, and the pygidium is covered by the elytra; four genera are found in Europe, of which two occur in Britain; three or four other tribes intervene between the Aphodiina and the Geotrúpina, of which the Hybalina and Hybosorina occur in Europe, but are not represented in our fauna.

- I. Antennæ with club longer than funiculus, not lamellate;
posterior angles of thorax right angles; size smaller . . . *ODONTÆUS*, *Klug*.
- II. Antennæ with club shorter than funiculus, lamellate; pos-
terior angles of thorax obtusely rounded; size larger . . . *GEOTRUPES*, *Latr*.

ODONTÆUS, *Klug*.

The three or four species that form this genus have been by many authors included under the genus *Bolboceras*, Kirby, which contains upwards of a hundred species that are widely distributed throughout the world; the species belonging to *Odontæus* proper have been described from North America and Europe, and appear to be distinguished by having the eyes entirely divided instead of only partially divided as in *Bolboceras*; the single European species is extremely rare in Britain, and may be at once known from *Geotrúpes* by its smaller size, the long club of the antennæ, the right angled posterior angles of thorax, and the long recurved moveable horn on the head of the male; it lives in dung, but has usually been taken in Britain on the wing.

O. mobilicornis, F. (*armiger*, Scop.; ♀ *bicolor*, F.). Short oval, very convex, upper surface glabrous, colour black or pitchy, occasionally, in immature specimens, ferruginous, under-side reddish or brownish-yellow, clothed with yellowish pubescence; head thickly and rugosely punctured in front; thorax punctured, with a fine longitudinal channel in centre which is abbreviated in front, posterior angles right angles; elytra with strong punctured striæ, interstices impunctate or almost impunctate; antennæ and legs yellowish, tibiæ darker, front tibiæ with eight teeth. L. 6–8 mm.

Male with an elongate, curved, moveable horn on forehead; thorax in front horned and foveolate on each side, and furnished with two teeth in the centre.

Female with two feeble prominences on forehead, and three on the front of thorax.

In small males the horn on forehead is much shorter, and the horns and foveæ on thorax are more or less obsolete.

In dung; generally taken on the wing; very rare; Charlton (Lady Maryon Wilson, one specimen taken in or about the year 1795 *); Darenth Wood (Rye); Croydon (Mason); Hollington and Guestling, near Hastings (Butler, &c.); Stephens records it from Hertford, Darenth Wood, Birch Wood, Dartford, Dorking, Coombe Wood, Wisbeach, Bristol, Norfolk, and Suffolk. Mr. Mason's specimen is one of the most recent instances of its capture in Britain: seeing a beetle flying past, he knocked it down with his stick to see what it was, and found it to be this very rare species.

GEOTRUPES, Latreille.

This genus contains upwards of a hundred species, which are chiefly found in temperate climates; the majority occur in Europe, Northern and Central Asia, and North America, and very few appear to be inhabitants of tropical countries; forty-five species are found in Europe, of which seven occur in Britain; they are large dark oval and convex insects, and may be known by the short thick lamellate club of antennæ, the obtusely rounded posterior angles of thorax, and the coriaceous lobes of the maxillæ. *G. stercorarius*, L., is one of the beetles that is most familiar to the ordinary observer of nature; it is the "shard-borne" beetle of Shakespeare, and goes by the popular names of "Dor Beetle," "Dumble-dor," or "Clock," and in some districts, as Mr. Rye observes, it is vulgarly called the "Lousy Watchman," from the fact that it is perpetually infested with a brown *Acarus*, a species of *Gamasus*; it flies with a heavy flight on still warm evenings in summer and autumn with a loud humming noise, and occasionally blunders into people's faces, in which case it inflicts rather a sharp blow; the species of *Geotrupes* live, as a rule, in dung, but are also found in decaying fungi, and sometimes at exuding sap; they have the power of making a sharp squeaking noise by rubbing the back of the hind femora against the abdomen.

The larva of *G. stercorarius* has the greater part of the abdominal segments of a slate colour or bluish-grey tint; the head and thorax are brownish, and part of the first abdominal segment is dirty-white; the female beetle digs a burrow about a foot or a foot and a half deep in the earth below a patch of dung, of which she carries down portions, and in them deposits an egg, from which in about eight days the larva hatches, and proceeds to feed on the food thus prepared for it; when this is consumed it is ready to assume the pupal state, and after a short time emerges as a perfect beetle; the larvæ of the *Geotrupina*, like those of the *Coprina* and *Aphodiina*, have the segments divided into transverse folds, but differ from these two tribes in the fact that the mandibles are furnished with several teeth, instead of being simply bidentate or tridentate.

- I. Thorax of male with three horns in front *G. TYPHÆUS*, L.
 II. Thorax of male without horns.

* This specimen is in Dr. Power's collection: Lady Maryon Wilson was one of our earliest working Coleopterists, and used to take many good species at the end of the last century, such as *Ludius ferrugineus*, *Crioceris merdigera*, &c.; of the latter species I have two or three specimens taken by her in my collection.

- i. Form oblong oval; striæ on elytra stronger; elytra without distinct cross striation; size larger.
 - 1. Elytra with seven striæ on each between suture and humeral prominence.
 - A. Abdomen longitudinally smooth in middle, neither punctured nor pubescent G. SPINIGER, Marsh.
(*stercorarius*, Er.)
 - B. Abdomen entirely (even in the middle) punctured and pubescent G. STERCORARIUS, L.
(*putridarius*, Er.)
 - 2. Elytra with nine striæ on each between suture and humeral prominence G. MUTATOR, Marsh.
- ii. Form short oval, subhemispherical; striæ of elytra feebler; elytra with more or less distinct cross striation, which is sometimes almost obsolete; size smaller.
 - 1. Upper surface with sculpture more distinct; thorax sparingly punctured G. SYLVATICUS, Panz.
 - 2. Upper surface with sculpture less distinct, as a rule very shiny.
 - A. Thorax closely punctured throughout G. VERNALIS, L.
 - B. Thorax almost impunctate on disc, plainly punctured at sides G. PYRENÆUS, Charp.

G. Typhæus, L. (*s.g. Typhæus*, Leach; *Minotaurus Typhæus*, Muls.). Black, shining, rather depressed, with the under-side and legs clothed with blackish hairs; antennæ black with club lighter; mandibles rounded at sides, emarginate externally before apex and pointed; head diamond-shaped in front with a strong raised margin, and a more or less defined longitudinal keel, sparingly punctured in male, rugose in female; thorax short, as broad as elytra, with the sides rounded; elytra with strong striæ which are feebly punctured at their base, and become finer towards sides and obsolete at apex; legs black. L. 11–18 mm.

Male with the thorax armed in front with three horns, of which the outer two reach as far as the front of the head, and are somewhat curved, and the intermediate one is much shorter and acuminate.

Female with the thorax much more strongly punctured at sides than in male, with two tubercles and a raised transverse ridge on its anterior margin.

In some males the horns are much abbreviated.

Sandy places, under cow-dung; somewhat local, but generally distributed from the midland districts southwards; rarer further north; Liverpool district, rare, one dead specimen found at Stourton (Gardner); Dunham Park, Manchester; not recorded from the extreme northern counties of England, or from Scotland; Ireland, near Dublin, Belfast, &c.

G. spiniger, Marsh. (*stercorarius*, Er., *nec* L.; *mesoleius*, Thoms.; *puncticollis*, Malin.). Oval, convex, black, not very shining, upper surface without pubescence, under-side of a deep shining violet-blue colour, sometimes greenish or coppery, clothed with shaggy pubescence and punctured, with a smooth longitudinal space in centre, which is neither punctured nor pubescent; head triangular, rugose, with a raised

longitudinal line; thorax in both sexes rather thickly punctured at sides, with the disc very diffusely punctured, and with a longitudinal line in centre, abbreviated in front, and chiefly indicated by an irregular single or double row of large punctures; the greatest breadth is behind middle; elytra at base about as broad as thorax, with rather strong but finely-punctured striæ, of which seven are placed between the suture and humeral prominence; legs black, posterior tibiæ with three carinæ on their outer side. L. 14–20 mm.

Male with the thorax larger than in female, the posterior femora armed before base with a sharp tubercle, and the trochanters produced into a spine at apex; the anterior tibiæ are longitudinally keeled in the middle beneath, the keel being more or less distinctly toothed, ending in a sharp tooth at the base of the third inflexed marginal tooth, and not enlarged before that tooth; the posterior femora and the apex of their trochanters are strongly toothed, the femoral tooth being somewhat the stronger of the two, and slightly recurved.

In dung; generally distributed and common throughout the kingdom.

G. stercorarius, L., *nec* Er. (*putridarius*, Er.). Closely allied to the preceding, but rather larger on an average, with the body more shining and more metallic; the chief distinguishing character, however, lies in the fact that the abdomen is punctured and pubescent throughout, even in the middle; the mandibles are simply sinuate at apex instead of bisinuate as in the preceding species; the thorax is impunctate or almost impunctate on disc, and not so thickly punctured at the sides, and the central line is less strongly indicated, and scarcely, if at all, punctured; the antennæ are usually lighter, but this is not a dependable character; in the male the anterior tibiæ are longitudinally keeled beneath, but the keel is not denticulate, and ends in an acute toothlet at the base of the third marginal tooth (which is scarcely inflexed), and is enlarged outwardly in a curve before this toothlet; the posterior trochanters and femora are toothed, with the teeth equal in size. L. 16–23 mm.

In dung; not so common perhaps as the preceding species, but apparently generally distributed throughout the kingdom.

(*G. foveatus*, Marsh. (*intermedius*, Ferr.; *punctato-striatus*, Steph.; *putridarius*, Muls.; *stercorarius* var. *minor*, Er.; *stercorarius* var. ♂, Thomson). This species of Marsham is retained in Dr. Sharp's catalogue and the European catalogue of Heyden, Reitter, and Weise, on the authority of Baron von Harold, who has made a particular study of the genus (Col. Heft. xi. pp. 87–101); there is, however, great confusion with regard to it, and I must say that I agree with Mr. Rye (to whose remarks on the species in the Entomologist's Annual for 1874 I am much indebted in the descriptions above given) in regarding it either as a myth or a hybrid; the anterior tibiæ appear to be altogether as in *G. spiniger*, Marsh., but the body is shining and metallic as in *G. stercorarius*, L., and

as in the latter species the abdomen is entirely punctured and pubescent; it is therefore plainly intermediate between the two species; according to Marsham the species is most like *G. spiniger*, but has four excavated punctures on the thorax, the disc of which is more remotely and the sides more thickly punctured; the scutellum is violet, the margins of the sulcate elytra and thorax blackish-blue; the posterior femora are furnished with one or two small teeth, and the anterior tibiæ with six teeth; the length is 14 mm. Mr. Rye confesses that he is unable to determine the species from any of his specimens, nor have I heard of any other person who has been able to do so; the question must therefore still be left in abeyance. Dr. Sharp in his Catalogue of Scottish Coleoptera mentions *G. foveatus* as occurring throughout Scotland, but he omits *G. spiniger* altogether, which appears to be the most common and widely distributed species of the genus; he obviously therefore regards them as synonymous.)

***G. mutator*, Marsh.** Closely allied to the preceding in size and general appearance, but at once distinguished by having nine striæ instead of seven between the suture and humeral prominence of the elytra; the upper surface, as a rule, appears to be slightly violaceous, but is sometimes bluish or greenish as in the preceding species; the under-side is metallic, sparingly punctured and pubescent, especially in middle; the mandibles are strongly rounded externally and slightly sinuate at apex; the thorax in both sexes is finely and diffusely punctured at sides and smooth in the middle, and in the middle is furnished with a fine central line, which is abbreviated in front, and is marked with a few punctures or almost impunctate; posterior tibiæ with three carinæ on their outer side; the general form is somewhat more oblong than in the two preceding species. L. 15–22 mm.

Male with the posterior femora near base, and the trochanters at apex, armed with a sharp tooth; anterior tibiæ with a keel underneath which is serrate and terminated in two teeth at apex.

In dung; generally distributed and more or less common in the London district and the south of England; Burnham, Somerset; Bath; Bristol; Swansea; Tewkesbury; Needwood Forest, Staffordshire; I do not, however, know of any locality further north than those here mentioned.

***G. sylvaticus*, Panz.** Smaller and rounder than either of the preceding species, upper surface without pubescence, of a shining blue-black colour with the margins more distinctly blue, under-side clothed with blackish pubescence, shining blue or violet-blue, closely punctured; head rugose with a distinct prominence in centre, antennæ reddish, with the exception of the first joint, which is dark; thorax as broad as elytra, broadest behind middle, narrowed in front, diffusely punctured on disc, more closely at sides, with a trace of a longitudinal furrow at base; scutellum with a few coarse punctures arranged longitudinally in middle; elytra with feeble and obsoletely punctured striæ, the interstices with

plain cross striation, and finely and diffusely punctured; mesosternum without prominence; legs black, posterior tibiæ with two transverse carinæ on their outer side. L. 10–16 mm.

Male with the anterior tibiæ furnished on their under-side with a central keel, which is serrate and tuberculate.

In dung, rotting fungi, &c.; common and generally distributed throughout the kingdom.

G. vernalis, L. Short oval, almost semiglobose, very shining, cyaneous with the margins strongly metallic, bluish or greenish; under-side closely punctured, clothed with blackish pubescence; antennæ black; head rugose with an obsolete frontal tubercle; thorax closely and thickly punctured, the punctuation consisting of larger and smaller punctures; scutellum with a few punctures at base; elytra with five rows of punctures, interstices with more or less distinct cross striation, sometimes almost smooth; mesosternum with a sharp cariniform prominence; legs black, posterior tibiæ with two carinæ on their outer side; the sculpture of the thorax will at once distinguish the species. L. 10–14 mm.

Male with the posterior femora dentate and serrate underneath on their anterior margin, and with the central keel of the anterior tibiæ also serrate, the latter being furnished with an emarginate tooth at apex.

In dung, decaying fungi, &c.; local, but widely distributed; London district, not uncommon, Greenwich, Plumstead, Esher, Coombe Wood, Belvedere, Wimbledon, &c.; New Forest; Devon; Llangollen; Swansea; Barmouth; Midland districts, generally distributed; Carlisle; not recorded by Bold from the Northumberland and Durham district; Scotland, rare, Highlands, Clyde, Tweed, Moray, Sutherland, and probably other districts; Ireland, near Dublin, Portrush, &c.

G. pyrenæus, Charp. (*vernalis*, Steph., *nec* L.; *politus*, Muls.). Closely allied to the preceding, of which it appears to have been considered a variety by some authors; it is, however, very easily distinguished by the following characters: form narrower in proportion to its length; upper surface more brilliant, smooth and shining; thorax impunctate or almost impunctate on disc and diffusely punctured at sides, with the posterior angles less rounded; abdomen impunctate and shining in middle beneath; male with the teeth on the under-side of the anterior tibiæ five or six instead of at least eight as in the preceding species. L. 10–14 mm.

Sandy heaths; in dung; local; London district, not uncommon, Esher, Belvedere, Wimbledon; in the latter locality it occurs commonly in the spring and autumn on the common; it is the *G. vernalis* of Stephens which he records from Ripley, Hertford, Epping, Croydon, Suffolk, New Forest and Devonshire, and as plentiful on Wimbledon Common.

TROGINA.

This tribe contains one genus, *Trox*; another genus, *Omorgus*, was formed by Erichson to include certain of the larger species, but the characters were indefinite, and it has not been retained; the members

of the tribe are oblong and convex, with a rough scabrous surface, and are often covered with a crust of dirt; they live in dry decomposing carcases, hides, horns, &c.; the antennæ are 9- or 10-jointed with the club 3-jointed; the ventral segments are five in number and free; the abdomen is covered by the elytra; all the coxæ are contiguous; the legs are comparatively slender and not strongly fossorial; the larvæ much resemble those of the *Aphodiina*, but are distinguished by having the antennæ 3-jointed instead of 5-jointed.

TROX, Fabricius.

This genus contains about a hundred species, which are very widely distributed in tropical, temperate, and cold countries, ranging from Siberia in the north to Patagonia in the south; eleven species occur in Europe, of which three are found in Britain, one of which is somewhat doubtfully indigenous.

I. Size larger; form broader; elytra considerably widened behind.

- i. Striæ of elytra strongly punctured *T. SABULOSUS*, L.
- ii. Striæ of elytra feebly punctured *T. HISPIDUS*, Laich.

II. Size smaller; form narrower; elytra not much widened behind

T. SCABER, L.

T. sabulosus, L. Obovate, black or greyish-black, very dull; head narrowed in front, rugose, antennæ reddish; thorax transverse, slightly narrowed in front, anterior angles projecting, posterior angles sharp right angles, upper surface uneven, very thickly punctured, sides and base and also sides of head fringed with yellowish setæ; elytra with flat, broad, strongly punctured striæ, alternate interstices raised and furnished with bunches of depressed short yellowish or greyish-yellow setæ; legs dull black. L. 7-8 mm.

Sandy places; in dry carcases, rams' horns, &c.; not common; Sundridge (Kent), Mickleham, Wimbledon, Coombe Wood, Headley; Dover; Hastings; Devon; Newmarket Heath; Bewdley; Cannock Chase; Scotland, very rare, Tay district.

T. hispidus, Laich. Of the size of the largest specimens of *T. sabulosus*, and very similar to it in form and sculpture; it differs, however, in having the striæ of the elytra finely punctured, and in the fact that the interstices are tuberculate, the rows being alternately large and small; the tubercles are furnished with bunches of moderately long erect yellowish setæ. L. 8 mm.

The species was introduced as British by Mr. Waterhouse in 1860 on the authority of a specimen or specimens of which he did not know the locality, and there is also a specimen in the Rev. A. Matthew's collection, which was taken by the Rev. H. Matthews.

T. scaber, L. (*arenarius*, F.). Much smaller and narrower than either of the preceding species, and less convex, oblong-obovate, slightly

widened behind, of a greyish-black colour, very dull; forehead thickly punctured; antennæ reddish; thorax slightly narrower than elytra, narrowed in front, anterior angles projecting, upper surface uneven, sides fringed with thickly set yellowish setæ; elytra with very shallow flat striæ which are obsoletely notched by cross punctures, interstices alternately furnished with larger and smaller bunches of very short brownish-yellow or yellowish setæ; legs blackish or reddish-brown. L. $5\frac{1}{3}$ –6 mm.

Sandy places; in dry carcasses, bones, hides, &c.; rather local, but not uncommon in several midland and southern localities, but very rare further north; London district, rather common, Blackheath, Dulwich, Mickleham, Coombe Wood, Forest Hill, Tilgate Forest, Tonbridge; Brandon, Suffolk; Hastings; Glanvilles Wootton (common in stock-doves' nests inside old apple trees); New Forest; Southampton; Braunston Burrows, Devon; Bristol; Swansea; Bewdley; Tewkesbury; Scarborough; Stretford and Dunham Park, Manchester; not recorded from the Northumberland and Durham district; Scotland, very rare, Solway district, "Jardine Hall, Murray's Cat."

SCARABÆIDÆ MELOLONTHINI.

As will be seen from the description before given (p. 9), this group is intermediate between the other two groups into which the Scarabæidæ are here divided. Dr. Horn and Dr. Leconte again divide the group into the Laparostict and Pleurostict Melolonthini, according to the position of the abdominal spiracles; as, however, none of the species belonging to the former of these groups are found in Britain, they need not here be discussed. A considerable number of genera and a large number of species are found in the group, but they are, with the exception of one or two genera, more characteristic of tropical than temperate climates; nineteen genera occur in Europe, containing about two hundred species; of these five genera, represented by only seven species, are found in Britain, and only two genera and three species have been recorded from Scotland.

- I. Tibiæ with one spur, which is sometimes obsolete; posterior tarsi with a single claw HOPLIA, Ill.
- II. Intermediate and posterior tibiæ with two spurs; posterior tarsi with two equal claws.
 - i. Antennæ with the club composed of three lamellæ.
 - 1. Anterior tibiæ short, with joints 2–4 scarcely longer than broad HOMALOPLIA, Steph.
 - 2. All the tibiæ long, with the joints elongate.
 - A. Upper surface with fine and very short pubescence; scutellum elongate triangular SERICA, McL.
 - B. Upper surface with long hirtose pubescence, especially on thorax and scutellum; scutellum somewhat rounded RHIZOTROGUS, Latr.
 - ii. Antennæ with the club composed of seven lamellæ in the male and six in the female MELOLONTHA, F.

HOPLIA, Illiger.

This genus contains about seventy or eighty species, of which twenty are found in Europe, and the remainder are widely distributed, representatives occurring in Siberia, China and Hong Kong, India, Madagascar and South Africa, Teneriffe, and North, Central and South America; one species only occurs in Britain, which may be easily known by the long single claw of the posterior tarsi.

H. philanthus, Füss. (*argentea*, Ol.; *pulverulenta*, F.). Upper surface finely squamulose, thorax clothed sparingly with small pale setæ; head black, much narrower than thorax, anterior margin strongly marked; thorax black, narrower than elytra, contracted in front and produced in middle of base, together with head finely, closely, and somewhat rugosely punctured; scutellum rounded; elytra depressed, rather uneven, finely and rugosely punctured; pygidium exposed, closely punctured; legs rather stout, anterior and intermediate pairs with unequal claws, posterior pair with a single claw. L. $6\frac{1}{2}$ –8 mm.

Male entirely dark or dark with fuscous or reddish-brown or reddish-testaceous elytra; scales on upper surface more scanty and cinereous, on the under surface thick and bluish; antennæ and legs black; female thicker and narrower, with the elytra always reddish-brown or reddish-testaceous; scales on upper surface, especially of thorax, greenish, or greenish-cinereous, on the under-side distinctly greenish; antennæ and legs red.

On flowering shrubs and plants; local, but usually common where it occurs; Battersea Fields, Tooting, Woking, Chatham, Lee, West Wickham, Sheerness, Purley, Highgate, Tonbridge, &c.; Pegwell Bay; Dover; Glanvilles Wootton; New Forest; Isle of Wight; Southampton; Cornwall, Devon, and Somerset; Swansea; Forest of Dean; Bewdley Forest; Knowle, near Birmingham; Ely; Newmarket; Notts; Manchester; Southport; Northumberland and Durham district, "abundant on our western border and about Lanercost" (Bold); it has not, however, been recorded from Scotland; it probably occurs in Ireland in several localities.

HOMALOPLIA, Stephens.

This genus contains thirteen or fourteen species, of which seven are found in Europe, and the remainder occur in Siberia, Algeria, Abyssinia, and Asia Minor; they are allied to *Serica*, but are less elongate and more depressed, and may be known by the shorter anterior tibiae and different pubescence; the single British species is one of the most local and rare of our Lamellicornia.

H. ruricola, F. Oblong, rather depressed, head and thorax black, elytra reddish, with the suture and margins sharply and rather broadly black; head thickly punctured, with anterior margin raised, antennæ reddish with club often darker; thorax transverse, gradually rounded and narrowed in front, strongly and not very thickly punctured, pilose,

especially at sides; scutellum dull black, rather large, sparingly punctured; elytra with rather irregularly punctured striæ, interstices with large punctures, which are arranged more or less in rows in the first and third interstices; under-side pubescent, rather sparingly punctured; legs black, with tarsi ferruginous. L. 5-7 mm.

Male with the pubescence of head and thorax black and the setæ at sides of elytra thicker; female with the pubescence greyish and the setæ at sides of elytra thinner.

On flowers, &c.; very local and, as a rule, rare; Stephens records as its only locality near London a portion of the western margin of Darenth Wood, between the lane leading from the village and Dartford; Dr. Power has taken it in Darenth Wood very sparingly, and it has also occurred at Mickleham; Sandwich (Waterhouse), Dover (C. G. Hall); Box Hill, Surrey and Rodborough Common, Gloucestershire (W. A. Blatch); Newmarket Heath, Cambridge, Sussex, and Swaffham Bulbeck, Norfolk (Stephens). In the Entomologist's Monthly Magazine for November, 1888, Mr. C. O. Waterhouse, in recording the capture of *Adrastus pusillus* near Sandwich, writes, "One calm sunny morning, *Homaloptia ruricola* was flying about in numbers amongst the grass in one spot. By examining a great number, I succeeded in obtaining several examples of the black variety, a form which I had not previously met with;" the abundance of this usually rare species at a particular spot and a particular time is very interesting as proving how very difficult it is to regard any "rare" species as otherwise than local.*

SERICA, McLeay.

This is a large and extensive genus and contains considerably more than a hundred species, which are very widely distributed, but are chiefly inhabitants of tropical countries; only eight occur in Europe, of which one is found rather commonly in Britain.

The larva of *S. brunnea*, apart from its size, bears a close resemblance to that of *Melolontha vulgaris*; the body however is more thickly pubescent, and the apex of the abdomen is furnished with thicker and longer hairs; the pupa is provided at the apex with a pair of strong horny points or spines which together form a crescent.

S. brunnea, L. Oblong, more or less obovate, subcylindrical, of a bright brownish-red colour, dull, with a slight frosted appearance; head dark, rugose, with rather large eyes, antennæ testaceous, 9-jointed, with the club composed of three lamellæ; thorax very transverse, slightly narrowed in front, rather diffusely punctured; elytra with nine rather deep striæ on each, interstices narrow, rather strongly punctured; legs rather long, reddish-testaceous. L. 8 mm.

Male with the club of the antennæ longer than the funiculus, the anterior angles of the thorax blunt and rounded, and the exterior claw of the anterior tarsi enlarged; female with the club of antennæ shorter than the funiculus and the anterior angles of the thorax projecting.

In sandy places; often on the wing; sometimes on and about poplars or decaying birch trees; often found dead in spiders' webs; somewhat local, but apparently very widely distributed throughout England and Wales, Ireland and the lowlands of

* This species has been taken very recently (June 1889) at Cobham Park by Dr. Sharp and Mr. J. J. Walker.

Scotland. Dr. Ellis (The Naturalist, June 1885, p. 249) remarks that he used to see this species flying in swarms round the gas lamps about Mossley Hill, Liverpool, and frequently netted them in mistake for Noctuæ.

RHIZOTROGUS, Latreille.

This genus contains upwards of two hundred species, which are nearly all found in temperate or cold climates; seventy-five occur in Europe, of which only two are found in Britain, and one of these is exceedingly rare; they much resemble *Melolontha* in general appearance, but are smaller, and may be easily known from the fact that the club of the antennæ is composed of only three lamellæ.

The larva of *Rhizotrogus* appears very closely to resemble that of *Melolontha* and does not need a separate description; that of *R. Falleni* (= *ochraceus*, Er.) will be found fully described by Schiödte (Part viii. p. 314); the larvæ of *R. solstitialis* are occasionally destructive to the roots of corn and grass.

- I. Elytra lighter; pygidium granulate. *R. SOLSTITIALIS*, L.
 II. Elytra darker; pygidium sparingly punctured *R. OCHRACEUS*, Knoch.

R. solstitialis, L. (*Amphimalla solstitialis*, Latr.) Oblong, rather elongate, moderately convex, of a fuscous or brownish-red colour; head dark, clypeus red, with a strong raised margin, antennæ 9-jointed, reddish-testaceous; thorax a little narrower than elytra, with sides rounded and gradually narrowed in front, posterior angles almost right angles, upper surface thickly and finely punctured, with a trace of a longitudinal furrow in middle; scutellum large, rugosely punctured, very thickly clothed with long yellowish hairs; elytra with more or less distinct raised lines, sparingly and feebly punctured, and very sparingly pilose; under surface densely pilose except in centre of abdomen; legs rather long, reddish-testaceous. L. 14–16 mm.

Male with the club of the antennæ much longer than in female, the thorax densely villose, especially at sides, and the anterior tibiæ simple externally; female with the thorax scarcely villose, and the anterior tibiæ armed with three teeth externally.

About hedges and trees, flying at dusk; frequently occurring in profusion where it is found, but decidedly local; London district, generally distributed; St. Peter's, Kent; Dover; Hastings; Sandown, Isle of Wight; Southampton; Devonshire; Bath; Swansea; Barmouth; Blandford; Ely; the only locality that I have heard of further north is "Ramparts, Tynemouth Castle," G. Wailes Esq. (Stephens, Ill. iii. 221).

R. ochraceus, Knoch. (*Amphimalla Falleni*, Muls.). Very like the preceding but of a darker colour and easily distinguished by the sculpture of the pygidium, which is sparingly punctured and thinly pilose; in the male the thorax is densely villose, and in the female sparingly pilose; occasionally forms occur both in this and the preceding species in which the thorax in both sexes is sparingly clothed with long ashy pubescence and is not villose in the male; the average size is decidedly smaller. L. 11–15 mm.

Very rare; Holyhead, Wales (Stevens and Brewer); one specimen recorded by Stephens from "probably Derbyshire or Yorkshire."

MELOLONTA, Fabricius.

This genus contains about twenty species, of which seven are found in Europe; the remainder are widely distributed, representatives occurring in China and Japan, India and Ceylon, Manilla, Java, Borneo, &c.; the species are, as a rule, of large size, and may be known by the fact that the antennal club is composed of seven lamellæ in the male and six in the female; the antennæ are 10-jointed, a character that will at once separate them from *Phyllopertha* and our species of *Rhizotrogus* (*Amphimalla*); the Melolonthæ are exceedingly destructive insects, as in the perfect state they devour leaves and in the larval state they consume the roots of grass.

The larva of *Melolontha vulgaris*, the common cockchafer, has been described by many authors; it is large, thick, and fleshy, of a dirty white colour, with the head ferruginous and shining, and the legs pale ferruginous; the antennæ are a little longer than the mandibles, and are 4-jointed; the anterior pairs of legs are rather shorter than the intermediate and posterior pairs, which are of equal length; the segments are transversely rugose, and the last is large and apparently divided by a false articulation; the upper surface of the body is furnished with short upright bristles, and long separate hairs which are intermingled with these; the pupa is rather large, with the abdominal portion slightly curved, but does not present any striking peculiarities.

The female cockchafer lays her eggs early in the summer, about six or eight inches below the surface of the ground; in from four to six weeks these hatch, and the insects continue in the larval state for three years; during the first year they attain a length of from 16 to 18 mm., and when full grown they are about one and a half inches long; in early spring they come up near the surface and feed on the roots of corn, grasses, and other plants, descending again deeper towards winter; at the end of the third summer they are full fed, and go down into the earth for a depth of two or more feet, where they form oval cells, and change into large fleshy pupæ, which have the abdomen terminated by two small pointed cerci; the insect continues in the pupa state about four weeks; the perfect beetles emerge about October, but do not leave the ground until the beginning of the following summer, when they come out in May and the beginning of June, and begin to feed on the foliage of oaks, chestnuts and other trees; they remain torpid under the leaves during the day, but fly towards dusk. As both in the perfect and the larval state these beetles do a great amount of damage, it is obvious that it is most important to find some means of preventing or checking their ravages; Miss Ormerod recommends that on ground where the insect is known to be present good drenchings of some fluid such as tobacco water or gas water should be used to drive the insect from the roots; it is however questionable whether this would do much good, as the larva can endure much more

poisonous substances, and if merely dislodged for the time would soon return again; hand-picking or beating is occasionally of service, as the beetles are easily captured on warm days, as they are very sluggish and cling beneath the leaves; on one occasion, referred to by Miss Ormerod (Manual of Injurious Insects, page 208) eighty bushels of the beetle were collected on one farm; birds and pigs, however, are the great enemies of the insect, rooks and sea-gulls especially devouring them with eagerness both in the larval and perfect state; these birds therefore should be always encouraged; rooks are often credited with pulling up plants or corn, but if each separate case were examined, it would be found that they destroyed little if anything beyond the infested plant, which would in any case have died, and left the larva free to attack others; the pest in all probability might be much diminished by ploughing the land, turning in pigs and poultry and encouraging the rooks, &c., and then going over it with a heavy roller, which would destroy the remainder that had escaped.

Two species of *Melolontha* are found in Britain; they may be distinguished as follows:—

- I. Pygidium elongate in both sexes and gradually narrowed to apex; average size larger *M. VULGARIS*, F.
- II. Pygidium shorter, constricted at base and very slightly widened at apex; average size smaller *M. HIPPOCASTANI*, F.

M. vulgaris, F. Oblong, moderately convex, but somewhat depressed on disc; head black with clypeus reddish in front, anterior margin raised, with rather long yellowish pubescence at sides, antennæ 10-jointed, reddish-testaceous; thorax transverse, black, or occasionally reddish, rounded at sides and narrowed in front, posterior angles projecting, strongly and not very closely punctured on disc, more thickly at sides, pubescent; scutellum large, almost semicircular, sparingly punctured, black; elytra ferruginous or reddish-testaceous, finely pubescent, with four raised lines on each, almost alutaceous, the sculpture being shallow and consisting of large and small punctures intermingled and more or less running into one another; under-side clothed with greyish or yellowish pubescence, which is much longer on the front part than on the abdomen; legs reddish-testaceous. L. 22–26 mm.

Male with the thorax villose at sides, and the antennæ terminated by a club consisting of seven lamellæ, which is longer than the funiculus; the third joint of the antennæ is somewhat dilated at apex, and bears a small setigerous tubercle.

Female with the thorax simply pubescent, and the antennæ terminated by a club consisting of six lamellæ, which is shorter than the funiculus.

About trees, &c.; flying at dusk; common and generally distributed from the midland districts southwards, but gradually becoming less common further north. Liverpool district, by no means abundant (Ellis); Scotland, local, Solway, Clyde, Forth, Tay and Argyle districts; Ireland, generally distributed, and common in the south.

M. hippocastani, F. Very like the preceding, but, on an average, a little smaller, and more darkly coloured; the general pubescence is thicker and of a more mealy appearance, and the hairs on the elytra are thicker and almost scale-like; the pygidium also, or rather its process, is more densely pubescent and constricted at base; in the male the third joint of the antennæ is thickened at apex and armed in front with a sharp tooth, and in the female the first lamella of the club is shorter than the remainder. L. 18–24 mm.

On and about trees, &c.; very local; Banks of Windermere (Stephens); Northumberland and Durham district, Long Benton and in the woods below Gilsland, not uncommon in the latter locality. Scotland, local, Clyde, Forth, Tay and Moray districts; Ireland, Roebuck and Greystones near Dublin; it does not occur in England further south than the Lake district, and in Scotland appears partly to take the place of the preceding species.

In giving the lengths for the Lamellicornia some authors appear to have reckoned to the apex of the elytra, and others to apex of pygidium; hence has arisen a discrepancy in certain cases, which I cannot otherwise explain.

(*Polyphylla*, Harris. Although all the specimens of *Polyphylla fullo* that have been taken in Britain are undoubtedly importations, yet as they are contained in all our old collections it is scarcely possible to pass over the insect without a short notice; the genus may easily be distinguished from *Melolontha* by the fact that the tarsal claws are toothed at base, and that in the female the club consists of only five lamellæ.)

P. fullo, F. (*Melolontha fullo*, auct.). A very large species, upper surface chestnut-brown, dark brown, or almost black, clothed with patches of white scales, which give the insect a variegated appearance; on the head they take the form of two lines near eyes, on the thorax of a longitudinal central line and lines and marks at sides, and on the elytra they are very irregular, and cause them to present a marbled appearance; the scutellum is thickly clothed with whitish or yellowish scales, and the under-side is very closely pubescent, the pubescence of the front part being villose; the sculpture of the upper surface is coarse; antennæ and legs lighter or darker reddish. L. 24–34 mm.

Stephens remarks that all the known British specimens have been captured on the sandy coasts of Kent, between Hythe and Ramsgate, chiefly in the neighbourhood of Deal and Sandwich, at which latter place eight examples were taken in July, 1815. Mr. W. Marshall, of Bexley, Kent, has in his possession a specimen taken alive near Belvedere, Kent; it had certainly been imported.

SCARABÆIDÆ PLEUROSTICTI.

In this group the abdominal spiracles, with the exception of the anterior ones, are situated in the dorsal portion of the last ventral

segments, forming rows which diverge strongly; the last one or two spiracles are usually visible behind the elytra; the clypeus is often prolonged and margined in front, but is very rarely concave as in the *Melolonthini*, and the mandibles occasionally project beyond the clypeus; the antennæ are 9 or 10-jointed, and the club is 3-jointed; the tarsi are all complete. The group contains a very large number of genera and species, many of them being amongst the most brilliant and conspicuous of all the Coleoptera; they are much more characteristic of tropical than of temperate countries; the groups may be divided into three tribes, the Rutelina, Dynastina, and Cetoniina; no representatives, however, of the second tribe are found in the British fauna; the other two may be divided as follows:—

- | | |
|-----------------------------------|------------|
| I. Tarsal claws unequal | RUTELINA. |
| II. Tarsal claws equal | CETONIINA. |

RUTELINA.

Upwards of a hundred genera and a large number of species are comprised in this tribe; of these only three genera, represented by fifty species, occur in Europe, and two genera, represented by only two species, are found in Britain; many of the species, especially those belonging to the true Rutelæ, are exceedingly brilliant and conspicuous insects; those, however, that are found in Europe are comparatively obscure; the true Rutelæ have the antennæ 10-jointed and prominent mandibles, whereas in the European species, which all belong to the Anomalæ, the antennæ are 9-jointed and the mandibles do not project beyond the clypeus; the tarsal claws are unequal, the outer one being the largest; in some genera, however, e.g. *Anomala*, the difference of size is not striking, whereas in *Phyllopertha* and others it is very evident.

- | | |
|---|----------------------|
| I. Base of thorax bordered; upper surface pilose . . . | PHYLLOPERTHA, Kirby. |
| II. Base of thorax not bordered; upper surface not pilose | ANOMALA, Sam. |

PHYLLOPERTHA, Kirby.

About fifteen species are contained in this genus, of which five occur in Europe; the others have been described from North and South Africa, Japan, Hong Kong, Siberia, and Mexico; our single species is sometimes very destructive to pasture land, and does considerable damage to gardens; they are commonly known as fieldchafers, Maybugs, bracken clocks, fernshaw beetles, fernwebs, and in Norfolk as "chovey."

The larva is figured and described by Curtis (*Farm Insects*, p. 217, 32, fig. 5, and p. 221), who also mentions the perfect insects as very destructive to rose trees and fruit trees; these larvæ are very similar to that of *Melolontha vulgaris*, but are, of course, much smaller; like the rest of the Lamellicornia larvæ their bodies are curved, but they are comparatively active; they are ochreous white, with the head darker, and the mandibles blackish at the tips; the body is clothed with a few brown hairs; when full grown they form cells a considerable distance below the surface of the

ground, in which they change into pale-coloured pupæ; these larvæ are most destructive to turf; as Curtis remarks, by their consuming the roots the grass dies; the dead turf becomes rotten, and will sink in patches under the feet, owing to the burrows which the maggots have made in the earth; and the rooks and starlings add to the disorder by pulling up the turf to feed upon them; they appear to continue in the larval state for three years; the remedies for their destruction appear to be much the same as those adopted to get rid of *Melolontha vulgaris*; as, however, the larvæ are more tender than those of the latter insect, it is probable that external dressings of gas liquor and salt water, or of lime, potash and other alkalies would have a greater effect in destroying them.*

P. horticola, L. Oblong, depressed, rather shining, pilose; head and thorax of a greenish or cyaneous colour, metallic, shining, elytra reddish-testaceous, with suture, as a rule, usually darker; head rugose in front, antennæ reddish with dark club; thorax narrower than elytra, transverse, narrowed in front, posterior angles prominent, disc coarsely punctured; scutellum large, almost semicircular, dark, sparingly punctured; elytra rather strongly, but not deeply, punctured in somewhat irregular rows; legs long, especially in the males; under-side of front parts villose. L. 7-10 mm.

Male with the body more thickly pilose, and the exterior claw more broadly dilated.

On flowers, young trees, &c.; commonly and generally distributed throughout the kingdom; more abundant in some years than in others; occasionally quite black specimens occur; small specimens are also rarely found in which the head and thorax are black with a bluish tinge, and the elytra are light testaceous, with the margins and suture black; these belong to the var. *suturalis*, Stephens; there is an old specimen of this variety in Dr. Power's collection, but this is the only one that I have seen.

ANOMALA, Samouelle.

This is a very extensive genus, and comprises upwards of three hundred species, the majority of which are found in tropical countries; they range however as far north as Siberia; fourteen or fifteen species inhabit Europe, of which one only is found in Britain; they may be known from *Phyllopertha* by their much more convex shape and the absence of a margin at the base of thorax, as well as by their glabrous, or almost glabrous, upper surface; our single British species is very variable in colour.

A. Frischii, F. (*ænea*, De G.; *Julii*, Fab., Gyll., Payk, &c.). Slightly obovate, strongly convex, moderately shining, head and thorax greenish æneous or greenish, sometimes cyaneous, elytra reddish, or reddish-brown, usually with a more or less distinct metallic reflection, sometimes entirely of a dark green metallic colour, concolorous with thorax; very rarely the elytra are cyaneous, and the head and thorax are greenish, or the whole

* It should perhaps be mentioned that this beetle is a good bait for trout, chub, and other fish; my earliest Coleopterous reminiscence is the collection of a number of these "fern-webs" as a small boy, in North Devon, for a relation who required them for fishing.

body is cyaneous; head thickly punctured, antennæ reddish with club blackish; thorax transverse, narrowed in front, sinuate at base, disc rather strongly and evenly punctured, posterior angles blunt; scutellum large, thickly and strongly punctured; elytra with punctured striæ, interstices of irregular breadth, the first the broadest, the wider ones flatter and more thickly punctured; under-side more or less metallic, thinly pubescent in front and at sides of abdomen; legs black or pitchy. L. 8-12 mm.

Male with the external claw of the anterior tarsi slightly dilated.

Sandy places on the coast, also by beating young trees; sometimes on the wing; generally distributed along the mid and southern coasts of England and Wales, but rarer further north; Scotland, rare, Clyde, Forth and Tay districts; Ireland co. Kerry, co. Cork, and near Belfast; it usually occurs on the coast or near the sea, but sometimes is found inland, and has been taken at Woking, Richmond, &c. The unicolorous green variety is very rare, and has occurred at Ripley, Surrey, Richmond, and Braunton Burrows, North Devon.

The *Anomala Donovanii* of Stephens appears to be a very rare variety of this species; it is described by him as follows on the authority of two specimens, locality unknown, in the British Museum, and two taken by Donovan in Glamorganshire:—"Black brass, slightly shining; elytra punctate-striate, testaceous, the suture, apex, and sides bronzed-black, the disc with a brown-red band across the middle; legs pitchy."

CETONIINA.

This tribe contains a very large number of genera and species, which are perpetually being added to, as the members of the tribe are such conspicuous insects that they attract the attention of even the most casual observers, and are therefore more often collected by travellers than perhaps those of any other group; some idea of the extent of the tribe may perhaps be gathered from the fact that since the publication of the Munich catalogue of the Scarabæidæ in 1869, no fewer than one hundred and forty-eight genera and eight hundred and fifty new species have been described; ten genera, represented by thirty-six species, occur in Europe, of which four genera and seven species are found in Britain; they may be known from the Rutelina by having the tarsal claws equal, and may be divided as follows:—

- I. Elytra emarginate at sides; epimera of mesothorax visible from above.
 - i. Legs stout; anterior tibiæ with three teeth on their outer side; tarsi not longer than tibiæ CETONIA, *Fab.*
 - ii. Legs less stout; anterior tibiæ with two teeth on their outer side; tarsi much longer than tibiæ (OXYTHEREA, *Muls.*)
- II. Elytra not emarginate at sides; epimera of mesothorax not visible from above.
 - i. Elytra taken together longer than broad; thorax glabrous GNORIMUS, *Serv.*
 - ii. Elytra taken together not longer than broad; thorax pilose TRICHIUS, *F.*

CETONIA, Fabricius.

This genus comprises nearly two hundred species, seventy-six of which are enumerated by M. Bergé in his supplement to the Munich Catalogue as having been described since 1869; it is probable therefore that the genus is much more extensive than is at present known; its members, as a rule, are very brilliantly coloured; of the sixteen European species we possess two as British.

The larva of *Cetonia aurata* is described and figured by Curtis (Farm Insects, page 108); it closely resembles the larva of *Melolontha vulgaris*, but may easily be distinguished by having a horny rusty spot on each side of the prothoracic segment; the legs also are longer and the upper surface is clothed with transverse series of ferruginous hairs; these larvæ live two or three years under ground; when they have attained their full growth they form an oval case of earth at a considerable depth as large as a walnut, which is covered outside with the excrement of the animal, and in this cell they change to yellowish pupæ; the larvæ, and also the perfect insects are often found in ants' nests. The perfect beetle is sometimes very destructive to roses; hence its popular name of the "Rose beetle" or "Rose chafer;" they also attack strawberries, turnips, and beans, and may be found on whitethorn, mountain ash, elder, lilac, candytuft, and various other flowers; it is not, however, very often that they commit any very serious depredations.

- I. Elytra sinuate at apex near suture; process of mesosternum globular, impunctate; posterior tibiæ with a strong raised tooth in middle; upper surface bright golden green *C. AURATA*, L.
- II. Elytra not, or scarcely, sinuate at apex near suture; process of mesosternum truncate, punctured; posterior tibiæ with a ridge terminating in a small point in middle; upper surface more or less bronze or coppery *C. FLORICOLA*, *Herbst.*

C. aurata, L. Oblong, depressed, of a bright golden green colour, shining; under-side of a bright reddish coppery colour; head thickly punctured, clypeus rather long, antennæ black, with first joint metallic; thorax gradually and rather strongly narrowed in front, sinuate at base, sparingly punctured on disc, more thickly at sides, scutellum large, elongate triangular, with a few scattered punctures at base or in middle; elytra depressed behind middle, with traces of raised lines, and with very shallow horse-shoe shaped punctures, which are partly arranged in lines and partly scattered; from middle to apex there are also more or less distinct transverse wavy whitish lines or small markings; the apex near suture is sinuate and presents an eroded appearance; pygidium coppery, thickly rugose; mesosternal process globular, impunctate; legs stout, black, more or less metallic. L. 14–20 mm.

Male with segments 1–5 of abdomen longitudinally impressed in middle.

On flowers, &c.; generally distributed and common in the London district and the South of England; Scilly Islands; not uncommon, although local, in the Midlands as far north as the Birmingham district; Gloucester, rather common; Bath, not common; Swansea; much rarer further north; Liverpool district, Rainhill; Isle of Man; not recorded from the Northumberland and Durham district; Scotland, very rare, Lowlands, Solway and Clyde districts; Ireland, near Belfast.

C. floricola, Herbst. (*ænea*, Gyll.; *metallica*, F.). Very like the preceding, but of an olivaceous æneous colour above, and a more violet, coppery colour beneath; the elytra are not, or scarcely sinuate at apex near suture, and their sculpture is rather thicker and more confluent; the process of the mesosternum is truncate at apex and punctured, and the tooth in the centre of the posterior tibiæ is much less pronounced; the colour of the upper surface varies somewhat and is occasionally greenish, but I have never seen a specimen that could be mistaken for *C. aurata*, even at first sight. L. 14–20 mm.

On flowers, &c.; local, and entirely confined to the North; Northumberland district, “near Stranton, Rev. R. Kirwood.” Scotland, local, Highlands, Tay, Dee, and Moray districts (Rannoch, Aviemore, &c.).

(**Oxytherea**, Mulsant.)

This genus has sometimes been included under *Cetonia*, but differs in the characters that have been before mentioned; it contains between fifty and sixty species, which, like the *Cetoniæ*, are chiefly found in tropical countries; four species are found in Europe; of these one has occurred occasionally in Britain, but is somewhat doubtfully indigenous.

O. stictica, L. (*funesta*, Poda). Black, with a slight bronzy-green or coppery reflection, shining, with the upper side thinly clothed with upright whitish hairs, thorax, elytra, sides of abdomen, and pygidium sprinkled with white spots; head thickly punctured, clypeus rather long; thorax somewhat thickly and strongly punctured, with a trace of a raised line and two rows of white spots on disc, and a white line within the outer margins; scutellum acuminate, smooth; elytra with rows of horse-shoe shaped punctures; interstices sparingly and simply punctured; pygidium punctured; process of mesosternum broad; sides of breast with long and thick pubescence; legs black. L. 9–12 mm.

Male with the segments of the abdomen impressed in middle, and with the first four segments furnished with a longitudinal row of white spots in middle; in the female these spots are wanting; in the male, moreover, the hinder tibiæ are dilated internally at apex.

On flowers, &c.; very rare and doubtfully indigenous as British; Stephens mentions three or four specimens as having been captured near Windsor by Mr. T. R. Griesbach, and also records it from Chichester; two specimens were taken by Mr. Sidebotham and one by Mr. Edleston, on the flowers of *Rosa spinosissima* on the Lancashire coast, in July, 1862 (v. Ent. Monthly Mag. i. 236); Mr. Reston also records it as having been taken upon shrubs in a garden at Whalley Range, Manchester.

GNORIMUS, Fabricius.

The species belonging to this and the following genus are very easily distinguished from the two that precede by having the elytra not emarginate at the sides, and the epimera of the mesothorax not visible from above, and by the fact that the thorax is very much narrower than

the elytra; the genus contains eight species, which are found in Europe, Armenia, Siberia, Japan, and North America; five occur in Europe, of which two are British; one of these is a very conspicuous insect, and at first sight resembles a *Cetonia*; they are both rare and are very seldom now found in the country.

- I. Upper surface mostly black *G. VARIABILIS*, L.
 II. Upper surface golden green, brilliant *G. NOBILIS*, L.

***G. variabilis*, L.** (*octopunctatus*, F.; *Trichius 8-punctatus*, Gyll.). Deep black, moderately shining; head thickly and rugosely punctured, eyes prominent, clypeus rather large, antennæ and palpi brown; thorax much narrower than elytra, contracted in front and rounded at sides and base, thickly and coarsely punctured, with an obsolete depressed central line, anterior angles very blunt, posterior angles rounded, but often marked by a small tooth; scutellum almost semicircular; elytra with feeble striæ, thickly and rugosely punctured, with several small whitish-yellow spots, which are mostly ranged transversely and irregularly across the middle or just behind middle; abdomen with whitish spots at sides; pygidium finely rugose with whitish-yellow spots; the latter, however, are not apparent in the female; breast more or less thickly pubescent, more so in male than in female; legs black, apex of tarsi sometimes bright red. L. 16–20 mm.

Male with the first four joints of the anterior tarsi thickly clothed with a brush of yellow hairs at apex, the pygidium convex and not furnished with tubercles at apex, and the intermediate tibiæ constricted and curved at base; the elytra are raised at apex into a more distinct blunt tubercular prominence than in female; in the latter sex the tarsi are not furnished with brushes of yellow hairs, and the pygidium is distinctly bituberculate; in my single female specimen the claws and apex of tarsi are bright red, but I do not know whether this is a sexual difference.

In the rotten wood of oaks, &c.; occasionally in flowers; rare; Tooting and Purley, Surrey; rotten oaks, Windsor Forest; in the latter locality it used to occur annually in some numbers, and most of our specimens come from this district; it has not, however, occurred there for a long time past. Stephens also records it from Penge and Brixton.

***G. nobilis*, L.** (*Trichius nobilis*, Gyll.). Very like the preceding in shape, sculpture, and general appearance, but at once known by its colour, which is brilliant golden green with the under-side coppery or reddish coppery; there are two whitish spots on thorax, and the elytra and abdomen, and also the pygidium in male are marked more or less distinctly with whitish-yellow spots or patches, which are very small on the elytra; the thorax has the margins broader behind than in *G. variabilis*, and the posterior angles more marked; the scutellum is strongly transverse, and the spiracles of the last two abdominal segments are usually free; the sexual characters are much the same, except that the

tubercles on the pygidium of the female are less strongly marked, and the intermediate tibiæ of the male are more strongly curved and constricted. L. 14–18 mm.

On flowers and in orchards, in the rotten wood mould of fruit trees, rare; Dartford, Kent; Tonbridge (Horner); Devonshire; Stephens records it from Darenth, Birch and Coombe Woods, Greenhithe Wood, and Carlisle (Illustr. iii. p. 231), and also from Devonshire (Manual, p. 170).

This and the preceding species appear to have become exceedingly scarce of late years; it is quite possible they may occur again; but at present they seem to be becoming extinct in Britain.

TRICHIUS, Fabricius.

This genus contains at present thirteen species; like those belonging to the preceding genus, they are mostly northern in their range; three are found in Europe, and the remainder have been described from Northern Asia, North America, and Japan; one has been found in Teneriffe; our two British species, under various names, appear to range right across Europe and Northern Asia, one of them having been found in Kamtschatka; they are of an orange or yellow colour, with dark bands, and owing to their velvety appearance and strongly villose thorax and abdomen present rather the appearance of a humble-bee than a beetle, especially when on the wing.

I. Average size larger; abdomen thickly villose at sides . *T. FASCIATUS*, L.

II. Average size smaller; abdomen bare, or almost bare,
at sides *T. ABDOMINALIS*, Mén.

T. fasciatus, L. Black, with the head and thorax clothed with very strong yellowish pilose pubescence, which is very long and thick; pygidium and breast with the pubescence long, thick, and pilose, but lighter; abdomen more thinly pubescent; elytra of a velvety-looking bright orange or yellow colour, with the scutellary region, as a rule, and the suture narrowly, a fascia at base usually meeting at scutellum, a fascia on middle not meeting at suture, and the apex, black; these markings vary in size and extent, but the first yellow band never reaches the shoulder; the apical patch is usually more or less round, raised, and shining, the apex of the elytra being raised into a blunt tubercle; head rather long, thickly punctured; clypeus bare in front, emarginate; antennæ reddish-brown, with club black; thorax much narrower than elytra, rounded at sides, and contracted in front, more finely punctured in the male than in the female, the sculpture, however, being hidden by the pilose pubescence; scutellum black, pilose and punctured; elytra dull, with scattered yellowish hairs, very feebly sculptured; pygidium finely rugose, with a white spot on each side at base. L. 10–13 mm.

Male with the anterior tarsi with the first joint dilated externally, and

the spur at apex of tibiæ longer, and also with the pubescence of the whole body longer.

Female with the first joint of the anterior tarsi simple, the spur of the anterior tibiæ shorter, and the pubescence of the whole body shorter.

On flowers; very local, and, as a rule, decidedly uncommon; it has been recorded by Dr. Leach from Exeter, and by Mr. Dillwyn as taken in some numbers on umbelliferous plants near Swansea (*v. Steph. Ill. iii. 280*), and Mr. Llewellyn has confirmed the latter record by taking it at Neath, South Wales; it occurs, however, principally in the North, and has not been recorded from any localities in England except those above mentioned; it is very probable that the Welsh record must be referred to the succeeding species; Scotland, local, Highlands, Tay, Dee, and Moray districts. Mr. Dillwyn's note on his capture of the species at Swansea is worth preserving (*Catalogue of Swansea Coleoptera*, p. 31):—"About forty of these beautiful insects have been taken in the neighbourhood, and I have generally seen them in pairs. With the exception of one pair, which I found on a double Sweet William, they were all taken on umbelliferous plants, and all, or nearly all, on the flowers of *Æthusa Cynapium*. It has also been taken both at Coytrahene and St. Hilary, in this county, by my friend the Rev. J. M. Traherne, and one was caught by my son, Mr. L. Ll. Dillwyn."

According to Erichson the larva is found in decaying trunks of various deciduous trees, such as alders, birches, &c. He does not, however, give any description of it.

T. abdominalis, Mén (*gallicus*, Heer.; *zonatus*, Schmidt). Very like the preceding, but, on an average, smaller, with shorter pubescence, and with the sides of the abdomen almost bare; the clypeus is shorter and less emarginate, and the thorax is broader, with the posterior angles more marked; the black fascia at base is always interrupted, and the first yellow band reaches the shoulder; the intermediate tibiæ are less distinctly toothed, and the male has the posterior tibiæ slightly clavate at apex. L. 9-12 mm.

On flowers, &c. I have had four or five specimens in my collection (from the late E. Brown's collection), but I have never been able to make out anything satisfactory with regard to their capture, nor do I know of any certain locality for the insect; Mr. F. Smith introduced *T. zonatus*, Germ., as British (*Zool. p. 2216* [1848]), but did not know the localities of the specimens. Mr. S. Stevens believes that his examples were taken in Wales.

The following is Mr. Smith's description of "*T. zonatus*, Schmidt (*gallicus*, Dej. Cat.; *abdominalis*, var., Schmidt, Dej. Cat.)". "Male.—The lateral margin of the thorax immaculate, the central segment of the abdomen transversely striated, and having two yellow maculæ; the anterior coxæ have a yellow macule in front. Female.—The lateral margins of the thorax yellow, sometimes interrupted; the ventral segments immaculate. The elytra in both sexes black, having the suture black, with two transverse yellow fasciæ united to a longitudinal one, which reaches the angle of the shoulder; the base never has a transverse black band; the yellow fasciæ are nearly or of quite equal width." In *T. fasciatus* the anterior coxæ in the male are not maculate, nor are the ventral segments, and in the female the thorax has a lateral

yellow mark. Mr. Smith adds that he has some idea that the Swansea and other West of England specimens may prove to be *T. zonatus*, and the northern specimens to be *T. fasciatus* (Zoologist, Aug. 15, 1848). Mr. S. Stevens is also of the same opinion, and believes that it was taken at Neath in 1845. I have in my collection an undoubted specimen of *T. fasciatus* labelled "Wales," from Mr. E. Brown's collection, but it is possible it may have been so labelled in error; others, however, are labelled "Scotland," as if to distinguish them; it seems strange that the question has not been cleared up during all these years, especially as Mr. Dillwyn seems to have taken them in numbers.

SERRICORNIA.

This series, like the Clavicornia (vide vol. i. p. 217) can only be retained for the sake of convenience, as it contains a number of genera and species, which, as far as general appearance go, might certainly with better reason be referred to the last-mentioned group; if, with Thomson, we remove the Ptinidæ and Cissidæ and their allies to the Clavicornia we obtain, perhaps, a more even series, but in this case such genera as *Ptilinus* and *Dorcatoma* form strong exceptions, while numbers of the Ptinidæ and Anobiidæ have more or less filiform antennæ, and cannot in any way be regarded as true Clavicorns; we have, moreover, still left in the Serricornia the species belonging to *Corynetes* and its allies which have strongly clavate antennæ, although it must be allowed that in many instances the club is more or less serro-clavate; it is very obvious, therefore, that the series is a very artificial one, and I should much prefer to drop it altogether, especially as, in writing a work like the present, one's views on Classification become very much modified as it proceeds; on the whole, however, I have thought it best to keep to the original arrangement I intended to follow. As before remarked (i. 217), the retention of these large divisions, as long as it is remembered that they are more or less artificial, presents many points of advantage to the general student, although the simple division into families is, perhaps, more scientifically correct.

The composition of the series has also been much disputed; as far as our fauna is concerned we may divide it into three groups, the *Sternoxi*, *Malacodermata*, and *Ptinoidea*, but the Cebrionidæ (through *Campylus*) and Rhipidoceridæ form strong connecting links between the first two, and might, perhaps, be ranked with either, and the *Malacodermata* are closely allied to the *Ptinoidea* through *Haplocnemus*, *Ernobius*, &c. The following are their chief characteristics:—

Sternoxi. Integument hard; form, with very few exceptions (e.g. *Trachys*) more or less elongate, and always more or less pointed behind; size very variable, but, as a rule, moderately large; head sunk in thorax, vertical or depressed; clypeus not, or very rarely, separated off by a

distinct suture ; antennæ nearly always serrate or pectinate, inserted on the forehead between the base of the mandibles ; prosternum produced into a spine or process received in a cavity on the mesosternum ; anterior coxæ globose, distant ; posterior coxæ, transverse, and immovable, receiving the femora ; elytra, as a rule, more or less plainly sinuate behind the posterior coxæ, usually striate ; anterior coxal cavities open behind ; tarsi plainly 5-jointed ; abdomen composed of five segments, the anterior two being often connate.

Malacodermata. Integument soft and flexible ; upper surface pubescent or pilose, never glabrous ; form variable, but usually more or less elongate and narrow, sometimes, however (as in *Cyphon* and *Scirtes*) short ovate or sub-hemispherical ; size variable, but usually moderately large ; head often large, with the eyes strongly projecting ; antennæ nearly always long, filiform, serrate, or gradually thickened towards apex, rarely (e.g. *Corynetes*) with a distinct club ; prosternum at most produced into a point, but never produced into a spine or process received in a fovea of the mesosternum ; anterior coxæ conical, very rarely subcylindrical, exserted, always contiguous at apex, which is somewhat prominent ; posterior coxæ, as a rule, contiguous ; anterior coxal cavities nearly always open behind ; tarsi usually five-jointed ; elytra rarely striate ; abdomen composed of six or seven, rarely five, free segments.

Ptinoidea. Integument, as a rule, hard, or moderately hard ; form very variable ; size usually small, sometimes minute ; thorax very often like a hood or cowl, covering, or partly covering, the head ; antennæ filiform, sometimes serrate, sometimes with a loosely-formed club ; mandibles stout ; prosternum short, not produced behind ; anterior coxæ not rounded, usually short-conical and more or less exserted ; posterior coxæ transverse ; anterior coxal cavities, as a rule, open behind (but closed in the Cissidæ and in *Lyctus*) ; tarsi five-jointed (four jointed in the Cissidæ) ; abdomen composed of five segments, the first of which is much elongate in the Lyctidæ, and to a less extent in the Cissidæ and Sphindidæ. As, however, the adoption of these divisions is much objected to by some authorities, it may be the best course to proceed according to the plan already adopted with the Clavicornia (vol. iii. pp 2—8), and arrange the Serricornia in families, giving the chief characteristics of each, which taken in conjunction with the characters above mentioned for the three groups, may perhaps enable the student to identify his genera with some approach to accuracy.

STERNOXI.

Buprestidæ. Head vertical, with the mandibles short and stout, inserted into the thorax as far as the eyes, which are very large, elliptical, and never emarginate ; antennæ inserted upon the front, short,

nearly always serrate ; posterior angles of thorax not produced ; abdomen with the first and second ventral segments connate ; anterior trochanters large and free ; surface more often metallic than in the succeeding families, often very brilliant.

Throscidæ. Antennæ inserted on the front, received in grooves beneath ; eleven-jointed, sometimes serrate, sometimes, as in our single genus, with a serrate, three-jointed club ; prosternum with an anterior rounded lobe protecting the mouth ; first and second abdominal segments not connate, though closely connected ; posterior angles of thorax more or less produced ; prothorax firmly articulated with the mesothorax ; anterior trochanters not marked ; front coxal cavities closed behind by the mesosternum ; insects small, not brightly coloured or conspicuous, without the power of leaping when placed on their back.

Eucnemidæ. Distinguished from the preceding by having the prothorax somewhat loosely articulated with the mesothorax, and the fact that its members have the power of leaping when placed on their back at all events slightly developed ; closely allied to the Elateridæ, but separated by having the antennæ inserted at the inner margin of the eyes and the labrum concealed ; the species are larger and more conspicuous than in the Throscidæ.

Elateridæ. Antennæ pectinate, serrate, or somewhat filiform, inserted immediately before eyes ; labrum visible and free ; prothorax very loosely articulated with the mesothorax, so that the power of leaping when the insects are placed on their backs is strongly developed in by far the majority of cases ; thorax with the posterior angles more or less produced ; front coxal cavities open behind, but entirely prosternal ; anterior trochanters not conspicuous ; abdomen composed of five ventral segments, which are free, or apparently free, the front two being sometimes closely connected, but not connate ; legs comparatively short, retractile ; size and colour very variable ; in many cases, however, the species are large, and often brilliantly metallic.

MALACODERMATA.

Dascillidæ. Antennæ filiform, very rarely serrate, not thickened at apex ; labrum distinct ; anterior coxal cavities open behind ; posterior coxæ immoveable, receiving the femora ; elytra not striated, covering the abdomen ; abdomen composed of five ventral segments.

Lycidæ. Antennæ often pectinate, always more or less serrate ; trochanters not applied to femora, but in a line with them ; anterior coxæ long, with distinct trochantins ; abdomen consisting of seven ventral segments, which are simple in both sexes ; intermediate coxæ distinct ; claws simple.

Lampyridæ. Very closely allied to the preceding, but with the

antennæ largely flabellate or simple, the trochanters applied obliquely to the femora, the claws often bifid, and the abdominal segments often cut in various ways in the male; the intermediate coxæ are subcontiguous, and the female is sometimes apterous.

Telephoridæ. Antennæ inserted between the eyes which are entire, at most only faintly serrate, usually quite simple, long or very long; trochanters applied to femora; edge of thorax often plicate (e.g. *Silis*); abdomen very soft, composed of six or seven segments, which are often divided or excised; elytra not, or obsoletely, striate; prosternum very short; legs long, claws simple or bifid.

Melyridæ. Antennæ serrate or pectinate, very rarely moniliform, inserted in front of the eyes on the produced part of the head; labrum distinct; prosternum short; body occasionally with extensile vesicles; abdomen composed of six free ventral segments, the sixth being occasionally indistinct; surface often very hairy and brilliantly coloured; tarsi 5-jointed, with the fourth joint entire, often furnished beneath with membranous pads or lobes; posterior coxæ prominent internally.

Cleridæ. Antennæ usually serrate, often pectinate (*Tillus*), but with the terminal three joints almost always tending to form a club (*Corynetes* and *Necrobia* being the ultimate forms), inserted behind the base of the mandibles; body hairy, and tarsi with lobes beneath (points which ally the family to the Melyridæ); thorax subcylindrical, with the sides not margined; abdomen composed of six ventral segments; posterior coxæ flat.

Drilidæ. Antennæ usually highly pectinate in the males; females apterous (this character may not be general); palpi often very abnormal (a character which brings the family near the Limexylonidæ; it is also closely allied to the Lampyridæ and Lycidæ, with which it has often been included as a tribe, and with which it agrees in the formation of the tibiæ, tarsi, and abdomen).

Limexylonidæ. Antennæ 11-jointed, serrate or subfiliform, inserted at the sides of the head, which is narrowed behind; maxillary palpi of the male very large and flabellate (in the European species); all the coxæ contiguous; abdomen consisting of five or six (according to Thomson six or seven) ventral segments; tarsi elongate, 5-jointed, with the joints entire; integuments soft; elytra, in our genera, covering or nearly covering abdomen.

PTINOIDEA.

Ptinidæ. Antennæ long and filiform, or very faintly serrate, never clavate, inserted upon the front, more or less contiguous at base, as a rule 11-jointed; head retractile; thorax narrower than elytra, and usually constricted at base; elytra, as a rule, more or less rounded and

sometimes globular, occasionally oblong, completely covering abdomen; legs long, not retractile; trochanters large, femora usually clavate; tarsi 5-jointed, with the first joint not shorter than the second; tibial spurs obsolete; abdomen composed of five ventral segments, of which the first is not elongate.

Anobiidæ. Closely allied to the preceding, but chiefly distinguished by the formation of the antennæ, which are either serrate or pectinate (occasionally flabellate), and have the three terminal joints nearly always elongate or thickened; they are either 10- or 11-jointed, and are inserted immediately in front of the eyes, and more or less distant at base; form usually oblong or cylindrical, occasionally sub-globose; head often covered by front of thorax; legs retractile, trochanters short; tarsi 5-jointed, with the first joint not shorter than the second; tibial spurs obsolete; abdomen composed of five ventral segments, of which the first is not elongate.

Bostrichidæ. Closely allied to the two preceding; form cylindrical and strongly convex; head strongly reflexed and covered by the front of the thorax, which is hood-shaped; antennæ short, with a 3-jointed club, inserted immediately in front of the eyes, at some distance from one another; anterior coxal cavities open behind; abdomen composed of five segments of equal length; tarsi 5-jointed, with the first joint very small, often more or less obsolete; tibial spurs distinct.

Lyctidæ. By many authors regarded as a tribe of the preceding, but easily distinguished by the distinct 2-jointed club of the antennæ, the elongate first ventral segment of the abdomen, and the fact that the anterior coxal cavities are closed behind; antennæ 11-jointed; head prominent; tarsi 5-jointed, with the first joint obsolete; form elongate and narrow.

Sphindidæ. Head short, prolonged in front; antennæ 10-jointed, with a 3-jointed club; anterior coxal cavities closed behind; abdomen composed of five free ventral segments, of which the first is the longest; tibiæ arcuate; tarsi compressed, with the last joint elongate, 5-jointed in the male, heteromerous in the female; size small, form oblong.

Cissidæ. Distinguished from all the preceding allied families by having the tarsi 4-jointed; head and front of thorax often horned or furnished with lamellæ in the male; antennæ 8-10-jointed, with the last three joints forming a loose club; anterior coxal cavities closed behind; elytra entirely covering abdomen, which is composed of five ventral segments, the first being the longest; size small or very small; form short and convex; upper surface, as a rule, rather strongly pubescent; by some authors the family is regarded as a depauperized form of the Bostrichidæ, in which the first tarsal joint is obsolete, so that the tarsi are often apparently 4-jointed.

BUPRESTIDÆ.

This genus contains a very large number of genera and species; in the catalogue of the Buprestidæ published by Gemminger and Von Harold in 1869 one hundred and fourteen genera and about two thousand seven hundred species are enumerated, and in the supplement published by M. Kerremans in 1883, twelve new genera and between nine hundred and a thousand new species have been added; by far the great majority of the species belonging to the family are found in tropical countries; they are amongst the most brilliant and strikingly coloured of all the Coleoptera; in fact, owing to the splendour of their metallic tints, they are often mounted in articles of jewellery, and their elytra are employed for the embroidering of dresses, scarves, and other articles of wearing apparel, so that they are perhaps amongst the most familiar of all beetles to the ordinary observer. The representatives of the family contained in the European fauna are comparatively few and obscure, but two or three genera are fairly well represented in the south of Europe; the total number of genera that occur on the Continent is twenty-seven, represented by upwards of three hundred species; in Britain, however, only four genera and ten species occur, some of which are extremely rare and are confined to the south of England; only two species are found very rarely in Scotland.

The following are the chief characters of the Buprestidæ:—Head vertical, with the mandibles short and stout, inserted into the thorax as far as the eyes, which are very large, elliptical, and never emarginate; antennæ inserted upon the front, 11-jointed, short, usually serrate, at least towards apex.

Thorax fitting closely to elytra, prosternum with a process behind which fits into the mesosternum, or sometimes attains the metasternum; anterior coxal cavities open behind; mesosternum short, with the epimera reaching the coxæ; metasternum with broad episterna, and with the epimera visible; elytra covering abdomen, or leaving only the pygidium exposed, wings ample; abdomen apparently composed of only five segments; legs short, tarsi 5-jointed.

The larvæ are very remarkable, being chiefly distinguished by the great development of the prothoracic segment, the smallness of the head, and the rudimentary condition or total absence of the legs; the head is retractile within the prothorax, the antennæ are very short, and there are no visible ocelli; the mandibles are short, hard, and toothed at the extremity and eminently fitted for gnawing the wood in which they live; the maxillæ, however, are very small; the meso- and metathorax are much shorter and narrower than the prothorax; the abdominal segments are nine in number, the anal segment being projecting and presenting the appearance of a tenth segment; the stigmata are crescent-shaped, and consist of nine pairs, of which eight are situated on the eight first segments of the abdomen and the ninth on the mesothorax, or between that segment and the prothorax.

These larvæ live under bark or often in solid wood, through which they bore galleries; hence they have often been imported, and several continental genera, such as *Dicerca*, *Ptosima*, *Chrysobothris*, &c., have been included as indigenous in

our old catalogues; occasionally exotic species have been found in Britain under curious circumstances, which seem to show that they may exist for a great many years in the larval state.

The four British genera may be distinguished as follows:—

- I. Tarsi elongate.
 - i. Thorax truncate at base; posterior coxæ scarcely distant, with the plates distinctly dilated internally . . . *ANTHAXIA, Esch.*
 - ii. Thorax excised and sinuate at base; posterior coxæ widely distant, with the plates scarcely dilated internally *AGRILUS, Sol.*
- II. Tarsi short; posterior coxæ widely distant.
 - i. Antennæ with the four last joints serrate; prosternum acuminate at apex; body elongate *APHANISTICUS, Latr.*
 - ii. Antennæ with the five last joints serrate; prosternum rounded at apex; body short and broad *TRACHYS, F.*

ANTHAXIA, Eschscholtz.

This genus contains upwards of a hundred and fifty species, which are very widely distributed, but are less characteristic of tropical climates than the greater part of the genera belonging to the family; they range from Siberia to the south of South America, and right across Europe, Asia, and North America; more than fifty species are found in Europe; they are small but very brilliantly coloured insects, and often occur abundantly on flowers in Southern Europe; at the least alarm, however, of a passing footstep or a shadow they take to flight, or gather in their limbs and drop among the herbage, a habit which is common to a large number of the *Buprestidæ*, and to many other conspicuous and brightly coloured insects, such as the *Sagridæ* and many of the *Curculionidæ*.

The larva of *Anthaxia candens* is described by Schiödte (Part iv. p. 373); it is remarkable for the size of the prothorax, which is three times as broad as the middle of the abdomen, and it is furnished with two large scansorial warty prominences on both the dorsal and ventral surfaces of the metathorax; the whole surface of the larvæ of the *Anthaxiæ*, except the head and prothoracic scuta, is covered with small transverse folds, and is sparingly pilose.

A. nitidula, L. Oblong, subparallel, of a beautiful golden green colour, shining, with the sculpture of the upper surface finely rugose, which gives it a frosted appearance; head much narrower than thorax, eyes large, antennæ of a dark metallic colour; thorax almost double as broad as long, truncate at base, transversely rugose, with sides rounded in front, posterior angles almost right angles; scutellum distinct, roundish; elytra subparallel, but rather sharply narrowed before apex, depressed, with thick and shallow rugose sculpture; under-side shining; legs rather long and slender, more or less metallic. L. 4–5 mm.

On flowers of whitethorn and celandine in May and June; very rare; taken near Brockenhurst by Turner, Dr. Power, and others; Dr. Power informed me shortly before his death that the plant on which the beetle was chiefly taken was the common celandine, *Ranunculus ficaria*; it has usually been supposed to have

occurred on the whitethorn only in the New Forest; the specimens differ considerably in size; in continental examples the female often has the thorax of a purplish colour, and the elytra sometimes cyaneous. Stephens (Illust. iii. 238) records *Anthaxia salicis* from Lordship Lane, Dulwich, but there evidently must have been some error in his record, as it has long been erased from our lists.

AGRILUS, Solier.

This genus is a very large and extensive one, and, as far as is at present known, contains nearly five hundred species, which are very widely distributed over the surface of the globe, from Siberia in the north to Patagonia in the south; the majority, however, occur in tropical countries; about fifty are found in Europe, of which five only occur in Britain; they are obtained by beating young birches, oaks, hazel, thorn bushes, &c.

The larva of *A. biguttatus*, which is found under the bark of oak, is described by Schiödte (Part iv. p. 374), but does not appear to present any striking characteristics; that of *A. viridis* has been described by Aubé, who detected it in the stems of young beech trees, which were much injured by its attacks; according to Westwood (Classif. i. p. 230) the larva is apod, broadest in front, and gradually diminishes towards the extremity of the body, which is armed with two horny points. These larvæ change to pupæ at the beginning of May, and the perfect insect appears about the middle of June; the pupæ, as is the case with all the Buprestidæ, have neither "styli motorii" nor cerci.

The five British species may be divided as follows:—

- I. Size larger; tarsal claws split at apex.
 - i. Sculpture of elytra less close; elytra blue or greenish, with two distinct white spots before apex *A. BIGUTTATUS, F.*
 - ii. Sculpture of elytra closer; elytra coppery or purplish-red, with white spots before apex almost always absent *A. SINUATUS, Ol.*
- II. Size smaller; tarsal claws toothed at base.
 - i. Colour unicolorous olive-green, rarely greenish-bronze, very rarely bluish.
 1. Antennæ strongly dilated in male *A. LATICORNIS, Ill.*
 2. Antennæ simple, not dilated in male.
 - A. Last segment of abdomen emarginate, longitudinally impressed in male; average size smaller *A. ANGUSTULUS, Ill.*
 - B. Last segment of abdomen rounded, not impressed in male; average size larger *A. VIRIDIS, L.*

***A. biguttatus*, F., nec Rossi** (*pannonicus*, Piller; *Anambus biguttatus*, Thoms.). Of a brilliant blue or bronze-green colour, occasionally æneous; head rugosely punctured, with the forehead impressed, antennæ short, of a dark metallic colour; thorax transverse, very slightly rounded at sides, uneven, transversely rugose; scutellum with a strong transverse engraved line; elytra depressed on disc, slightly broader at base than thorax, rather strongly acuminate towards apex, with shoulders plainly marked, rather closely and rugosely sculptured, with a very distinct small spot of white hairs on each near suture before apex; under-side

shining, punctured, with three white spots on each side of abdomen; legs more or less metallic. L. 8–12 mm.

Male with the anterior tibiæ terminating in a small hook on their inner side.

Found flying about old oak stumps, and settling on them; the larva is found in the bark of oak stumps in fresh clearings in woods; very local; Darenth Wood (where it has been taken in numbers by Dr. Power, and also by Mr. Champion); Hampstead and Cuckfield (Stephens).

A. sinuatus, Ol. (*chryseis*, Curt.). Of a coppery-red or purplish colour, dull, under-side bronze-green; very closely allied to the preceding, but with the elytra more closely sculptured and more evidently granulate, and almost always without a white spot before apex; the abdomen, moreover, is without the white spots at the sides, and the front margin of the prosternum is deeply and triangularly emarginate; the last segment of the abdomen is entire; the average size is smaller than in *A. biguttatus*. L. 7–8 mm.

On low thorn bushes; very rare; near Brockenhurst, July and August (Turner, Matthews, and others); near Windsor and London (Stephens).

A laticornis, Ill. (*laticollis*, Kies.). Elongate, narrow, gradually contracted behind, somewhat depressed on disc, of an olivaceous green colour; head rather strongly and rugosely punctured, forehead flat, vertex of head obsoletely furrowed, antennæ as long as head and thorax, very strongly widened in the middle in the male; female with the antennæ thinner than in the male, but still somewhat dilated; thorax transverse, somewhat widened in front, coarsely and rugosely punctured, more or less strongly impressed at base; scutellum with engraved transverse line; elytra long and narrow, granulate, narrowed at apex; legs dark metallic. L. 4–5 mm.

Besides the difference in the antennæ, the male has the last segment of the abdomen longitudinally impressed in middle, and the anterior tibiæ sinuate towards apex and terminating in a small hook.

By beating young hazels, oak, birch, &c.; local, but not uncommon where it occurs; Darenth Wood, Leith Hill, Coombe Wood, Shirley, Ashted, Balcombe, Tonbridge, &c.; Portsmouth district; New Forest; Bewdley Forest; Buddon Wood, Leicestershire; Hopwas Wood, Tamworth; Robins Wood, Repton; York.

A. angustulus, Ill. (*olivaceus*, Gyll.). Very closely allied to the preceding, but distinguished by the antennæ not being dilated in male, and by the fact that the second abdominal segment in the same sex has two small prominences in the middle of apex; these, however, are occasionally obsolete, and cannot always be regarded as a reliable character; in the female the sutural angle is simple, whereas in *A. laticornis* it is slightly produced; in general shape and structure the species so closely resembles the preceding that it does not require a separate description. L. $3\frac{1}{2}$ –5 mm.

By beating young birch, hazel, &c.; local, but not uncommon where it occurs; Darenth Wood (in abundance), Esher, Reigate, Ripley, Ashted, Caterham, Chobham, Woking, Tonbridge, &c.; Guestling, near Hastings; Southsea; New Forest; Haywood, Glanvilles Wootton; Hertford; Suffolk; Bewdley Forest; Trench Woods; Robins Wood, Repton; York.

A. viridis, L. (*viridipennis*, Lap.; *quercinus*, Redt.). Rather larger than the two preceding species, but closely allied to them in colour and general appearance; it is, however, distinguished by having the eyes sinuate on their inner margin, the thorax with the basal lateral foveæ less deep, and the elytra not broadly rounded at apex, and the apex plainly serrulate, whereas in the other two species the denticulation is very indistinct; the last ventral segment of the abdomen, moreover, is rounded and has no impression in the male, and the forehead is even and not furnished with a shallow furrow on vertex; from *A. laticornis* the species may, of course, be distinguished by the formation of the antennæ. L. 5-7 mm.

On young trees, especially oaks; very rare; Buddon Wood and Mount Sorrel (Power); Woodford (Turner); York (R. Cooke); Scotland, very rare, Solway and Argyle districts; there are very few specimens of the species in our collections, and probably large specimens of *A. angustulus* are often confused with it.

APHANISTICUS, Latreille.

This genus contains about forty species, which are widely distributed, species having been recorded from Egypt and Algeria, Madagascar, Natal, Ceylon, Japan, Mexico, the Malay Peninsula, the Australian region, &c.; seven are found in Europe, of which one only occurs in Britain, and that very rarely.

A. pusillus, Ol. (*lineola*, Germ.). Elongate, black, shining, with a feeble æneous reflection, upper surface rather convex; head large, very strongly furrowed, almost bilobed; antennæ short, with the first two joints thickened, and the last four serrate; thorax transverse, convex, with three transverse impressions, posterior angles acute; upper surface of head and thorax very finely wrinkled, alutaceous; scutellum small, triangular; elytra at base about as broad as base of thorax, slightly widened behind middle, and narrowed towards apex, finely punctured in somewhat irregular rows, apex obtusely truncate; legs black, femora dilated on their inferior margin, tarsi short with the joints lobed. L. $1\frac{1}{2}$ - $2\frac{1}{2}$ mm.

Grassy places, by sweeping; also occasionally by beating hedges, and in moss; rare; Woking, Coombe Wood, Chatham, Strood, Southend; Deal (Champion); Folkestone (Waterhouse); Bury Hill, Arundel; Carisbrooke Castle, Isle of Wight; Newland Common, near Glanvilles Wootton (Dale and Wollaston); Kingsbridge; Bath; Gamlinghay, Cambridge (Power); Scarborough (Lawson).

TRACHYS, Fabricius.

The species contained in this genus may be easily known by their

very short broad form, which is almost triangular, being wide in front and much narrowed behind; the antennæ have the five last joints serrate, and the femora are not dilated; the thorax is transverse, and is strongly produced in the middle of base; the genus is rather an extensive one, comprising, as at present known, more than ninety species; twelve of these occur in Europe, and the remainder are widely distributed; the majority, however, appear to occur in the Malay Peninsula and the adjacent region; several species have comparatively recently been described from Siberia and the Amur district and Japan, which makes it probable that the genus will ultimately prove to be very much larger than is at present known.

The larva of *T. minuta* is figured in two positions by Schiödte (Part iv., pl. ii., f. 18 and 19); it presents a very curious appearance, owing to the very large prothoracic segment into which the small head is sunk, the very short mesothorax, which is, however, as broad as the prothorax, and the large number of scansorial warty appendages, of which eight pairs are dorsal and seven pairs ventral; the sides of the segments are also furnished with large knobbed prominences which are slightly setose, and the segments themselves are much incised at their junction; the ninth segment is much narrower than the preceding, and the anal appendage seems as if it were a continuation of the latter segment; the larva is light-coloured, with the scuta dark; these latter are small, with the exception of that on the prothorax, and vary considerably in shape, that on the metathorax being almost cruciform, and those on the first seven segments of the abdomen being almost hammer-shaped; the legs are obsolete: this larva mines the leaves of the hazel, on which plant the perfect insect is very often found.

There are three British species, which may be distinguished as follows:—

- I. Upper surface black with more or less distinct whitish pubescence.
 - i. Size larger; upper surface more depressed; elytra with punctuation not strong, and more or less confused *T. MINUTA*, L.
 - ii. Size smaller; upper surface more convex; elytra with punctuation strong, and arranged in more or less regular rows *T. PUMILA*, Ill.
- II. Head and thorax coppery; elytra dark blue, with the punctuation rather strong, and arranged in more or less regular rows *T. TROGLODYTES*, Gyll.

***T. minuta*, L.** Black, with a slight æneous reflection; form short and broad, narrowed behind; head smooth, very strongly impressed between eyes; antennæ short, with the last five joints serrate; thorax much broader than long, narrowed in front, with two transverse impressions on each side, finely and not distinctly punctured; scutellum very small; elytra broader than thorax, with shoulders strongly marked, rather depressed and uneven on disc, much narrowed towards apex, irregularly and indistinctly punctured, with four well-marked wavy bands of depressed whitish hairs, which are sometimes more or less obsolete; legs black, tarsi very short. L. $2\frac{1}{2}$ – $3\frac{1}{2}$ mm.

By beating sallows, hazels, &c.; local; London district, not uncommon, Cobham,

Chatham, Darenth Wood, Coombe Wood, Chattenden; Hastings; Portsmouth district; Dorset; Lords Wood, Southampton; Huntingdonshire; Wood Ditton, Cambridge; Langworth Wood, Lincoln.

T. pumila, Ill. (*intermedia*, Lap.). Allied to the preceding, but at once distinguished by its smaller size, and shorter, more ovate, and more convex form, as well as by its more shining appearance, more even surface, and the very strong and much more distinct and regular punctuation of the elytra; the shoulders of the latter are not so much marked and the sides are more rounded near base, and the pubescence is uneven, and often obsolete, and when present does not take the form of waved bands; the size is very variable. L. $1\frac{1}{4}$ – $2\frac{2}{3}$ mm.

By sweeping herbage; occasionally at the roots of plants (*Marrubium vulgare*, &c.), and in moss on chalky hill-sides; extremely local; Mickleham, Surrey, where it has been found in numbers by Dr. Power, and subsequently has been taken by Mr. Champion; Southwick, near Southsea (Moncreaff); I know of no other British locality for this insect; it used to be erroneously inserted in our catalogues as *T. nana*, F., which is a different species that has not hitherto occurred in Britain.

T. troglodytes, Gyll., *nec* Lap. (*pygmæa*, W. C., *nec* F.). Of much the same shape as the preceding, but easily distinguished by its colour; head and thorax of a dark shining coppery colour, the former deeply excavate and channelled, the latter even, except for slight depressions at sides, finely and sparingly punctured, and occasionally impunctate; elytra without pubescence, of a dark blue colour, convex, rather strongly but not deeply punctured in rows, and in part transversely rugose; under-side brownish-bronze; legs dark, more or less metallic. L. $2\frac{1}{2}$ mm.

By sweeping herbage, flowers, &c.; occasionally in moss; very widely distributed, but always rare; Coombe Wood (Stephens); Chatham (J. J. Walker); Folkestone (Waterhouse); Guestling, near Hastings (Butler); New Forest; Glanvilles Wootton (Dale and Wollaston); Holm Bush, Brighton (Power); Weston; Barmouth (Chappell); Cambridge (Stephens); St. Faith's, Norwich (Power); Hornsea; Knowle, near Birmingham (Blatch); Scotland, very rare, Solway district (Sharp).

THROSCIDÆ.

This family has been by several authors classed with the Eucnemidæ, but appears to be distinct by reason of the formation of the anterior coxal cavities, which are formed by the pro- and mesosternum, whereas these parts in the Eucnemidæ and the Elateridæ are entirely prosternal; this character is also found in the Scaphidiidæ, and has been before alluded to as being to a certain extent present in *Ephistemus* (Vol. III. p. 7); from the Elateridæ the family is distinguished by the fact that the thorax is more closely applied to the body, and that the species have not the power of leaping if placed on their back. The following are some of the chief characters:—Head sunk in thorax as far as eyes,

which are hairy and usually emarginate or divided; antennæ inserted on the front, received in grooves beneath, 11-jointed, sometimes serrate, sometimes as in our single genus, with a serrate 3-jointed club; prosternum with an anterior rounded lobe protecting the mouth, slightly prolonged behind into a flat process received in the mesosternum, which is short; elytra completely covering abdomen; abdomen with five ventral segments; anterior and middle coxæ small, rounded, and not prominent; posterior coxæ dilated internally; legs short, retractile; tarsi short, 5-jointed; the species are slow in their movements, and are found by sweeping herbage or flowers, at the roots of grass, in moss, haystack and flood refuse, &c.; they are small and inconspicuous-looking insects, and in some cases are very hard to determine with accuracy.

According to the Munich catalogue the family contains four genera and more than a hundred species, which are widely distributed both in temperate and tropical climates; two genera, *Drapetes* and *Throscus*, are found in Europe, represented by about a dozen species; of these, four species, all belonging to the latter genus, occur in Britain.

THROSCUS, Latreille. (*Trixagus*, Kugelann.)*

This genus contains about one quarter of the species at present known as belonging to the family; these are chiefly found in Europe and North America; a few have been recorded from Brazil, Northern India, and the Australian region, but as a rule their place is taken in the tropics by the genus *Drapetes*; our British species may be divided as follows:—

- I. Length exceeding 2 mm.; colour, as a rule, darker.
 - i. Eyes divided until middle; thorax less narrowed in front T. DERMESTOIDES, L.
 - ii. Eyes divided considerably beyond middle; thorax evidently more narrowed in front, at all events in the male T. CARINIFRONS, Bonv.
- II. Length not exceeding 2 mm.; colour, as a rule, lighter; eyes divided considerably beyond middle.
 - i. Head with two raised lines; form longer and less oval; antennæ longer T. ELATEROIDES, Heer.
 - ii. Head without raised lines; form shorter and more oval; antennæ shorter T. OBTUSUS, Curt.

T. dermestoides, L. (*adstrictor*, Panz.). Elongate-oval, more or less narrowed at apex, of a reddish-brown colour, rather thickly clothed with fine silky recumbent greyish pubescence; head with two feebly raised parallel longitudinal lines, eyes divided to middle; antennæ as long as thorax, with a 3-jointed club; thorax broader

* The name *Trixagus*, Kugelann, has the priority, but, as Erichson has pointed out, it is applied by its author to a genus composed of both *Throscus* and *Byturus*, and therefore must be dropped for both.

than long, distinctly narrowed in front, with a double punctuation, consisting of rather diffuse larger punctures and very fine smaller punctures; this latter character is only visible under a strong magnifying power; the base is sinuate, and the posterior angles are strongly projecting; elytra moderately convex, gradually narrowed behind, obtusely rounded at apex, with fine punctured striæ, and with the interstices very finely rugose and, besides, finely punctured; legs ferruginous. L. $2\frac{1}{2}$ –3 mm.

Male with the club of the antennæ larger, longer than the funiculus; female with the club smaller, shorter than the funiculus.

By sweeping herbage; occasionally found on palings, in sandpits, &c.; local; generally distributed and common in the London district; Hastings; Portsmouth district; New Forest; Glanvilles Wootton; Snowdon; Hertford; Knowle; Bewdley; Cannock Chase; Bramhall, Cheshire; Barton Moss; Scarborough; Scotland, very local, Solway, Clyde, and Forth districts; Ireland, near Belfast: it is probable that it is often passed over by ordinary collectors, as it gathers up its legs and looks much like a seed in the net.

T. carinifrons, Bonv. (*elateroides*, Redt., nec Heer.). This species so closely resembles the preceding that it was for many years mixed with it in some collections; it may, however, be distinguished by the following characters:—The forehead has the two frontal carinæ more distinct, and the eyes are divided by a narrow horny plate considerably beyond the middle; the thorax, in the male at least, is flatter, and much more contracted in front, and the elytra are more acuminate, with the striæ more delicately impressed, and the punctures on the interstices more distinct, the surface being less coarsely rugose. L. $2\frac{1}{2}$ –3 mm.

By sweeping in woods; occasionally on palings; rare, but probably overlooked; Chislehurst (Matthews); Sheppey (Champion and Walker); Tonbridge (Wollaston, and recently taken in numbers at the same place by A. C. Horner); Shirley, Esher, Tilgate, Forest Hill; New Forest; Southampton (Walker); Glanvilles Wootton; according to Redtenbacher it is very common at Vienna on *Parietaria officinalis*.

T. elateroides, Heer., nec Redt. (*gracilis*, Woll.). This species in general shape and structure is closely allied to *T. carinifrons*, from which, however, it may at once be known by its very much smaller size, as well as by the more finely sculptured elytra, of which the interstices are more thickly punctured; from *T. dermestoides* it may further be known by having the eyes more divided, and the frontal carinæ more distinct and extended further to base of head; in size it resembles *T. obtusus*, but is more elongate, with longer antennæ, and may be known by the presence of the frontal carinæ. L. 2 mm.

At roots of grass, and in moss, flood refuse, &c.; often in salt marshes; usually found in early spring; rare; Chatham (Brewer); Sheerness (Walker); Cowley (Power); according to Redtenbacher it is found on *Parietaria officinalis*.

T. obtusus, Curt. (*pusillus*, Heer.). The smallest of our species; allied to the preceding, but shorter, with the elytra shorter and less

narrowed behind, and the thorax less narrowed in front; the antennæ, moreover, are shorter, and the elytra finely but not so closely punctured; from all the three preceding it may be known, apart from other differences, by the fact that the head has no raised carinæ; it is, too, more oval than any of our other species. L. $1\frac{1}{2}$ – $1\frac{3}{4}$ mm.

In moss, haystack and flood refuse, &c.; not common (although occasionally found in some numbers), and very local; Lee; Sheerness (where Mr. J. J. Walker once found it in abundance in moss on stumps of trees in winter); Chatham; Ripley, Surrey; Forest Hill; Highgate; Eynsham; Plaistow Marshes; Dagenham; Harwich; Southsea district out of furze, by beating, January to June; Isle of Wight; Weymouth.

EUCNEMIDÆ.

This family has been by some authors included under the Elateridæ, to which it is closely allied; in fact, it appears to be somewhat doubtful whether it ought to be separated, as the only real differences seem to lie in the fact that the labrum is concealed, and in the insertion of the antennæ, which, as Dr. Horn has pointed out, are inserted upon the front, at the inner extremity of transverse grooves, before which the front is expanded again; they are placed further from the eyes than in the Elateridæ, but in many cases, e.g. *Eucnemis* and *Melasis*, are very far from being contiguous, a character which has sometimes been put forward for the family; another mistake that has been made with regard to this family is the statement that they do not possess the power of leaping when placed on their backs, which is so characteristic of the Elateridæ; in some cases it is absent, and in others little developed, but in *Eucnemis*, as pointed out by Ahrens seventy years ago, it is very marked, and the same is the case with other genera.

The family contains nearly a hundred genera, comprising about five hundred species; they are chiefly found in tropical countries, but a fair number are found in Europe and North America; if we exclude the Thoroscidæ and Cerophytidæ, we may reckon fifteen genera and thirty species as occurring on the former continent, of which three genera and three species are found in Britain; these are all rare, and the genus *Eucnemis* has only quite recently been detected in the New Forest.

The larvæ of the Eucnemidæ appear to bear a somewhat close relation to those of the Buprestidæ, but those that are known differ from them by having the labial palpi and maxillæ either entirely wanting or quite rudimentary. Schiödte classified the larva of *Melasis buprestoides* amongst the Elateridæ, all of which he considered to be carnivorous, but Dr. Sharp has pointed out that the larvæ of *Eucnemis capucina* are certainly not truly carnivorous, but probably live by imbibing the juices of the decayed wood in which they are found.

- I. Maxillary palpi with the last joint acute; antennæ distant, flabellate in male, pectinate in female; thorax widest in front MELASIS, Ol.
- II. Maxillary palpi with the last joint large, more or less dilated; thorax widest behind.

- i. Antennæ moderately distant, simply serrate in both sexes; elytra without trace of striæ EUCNEMIS, *Ahr.*
- ii. Antennæ approximate, pectinate in male (in our species); elytra with striæ more or less distinct . . . MICRORRHAGUS, *Eschs.*

MELASIS, Olivier.

This genus comprises three or four species, one of which is found in Europe, and the others have been described from North and Central America; they are elongate and cylindrical, and live in wood in which the larvæ bore galleries, or, according to some authors, are parasitic on certain wood-boring insects.

The larva of *Melasis buprestoides* is described and figured by Schiödte (Part v. p. 49, plate iii.); it much resembles the larvæ of certain of the *Buprestidæ*, the head being very small and sunk in the prothorax, which is broader and much larger than the meso- and metathorax; the antennæ are very minute, and the maxillæ and labium are obsolete; the abdominal segments are all much longer than the meso- and metathorax, and are all transverse with the exception of the ninth, which is conical and obtuse and not furnished with cerci; there are no scuta, except on the prothorax; the spiracles are of a short ovate form, those on the prothorax being the largest; the legs are obsolete; the larva is white, with the clypeus and mandibles ferruginous.

M. buprestoides, L. (♂ *v. elateroides*, Ill.). Elongate, cylindrical, clothed with fine and sparing greyish pubescence, dull black, with the antennæ and legs fuscous or pitchy red, elytra sometimes lighter than the front parts; head large, vertical, rather thickly and coarsely punctured; antennæ varying somewhat in the sexes; thorax broadest in front, very gradually narrowed to base, coarsely sculptured, posterior angles projecting; elytra long, gradually narrowed to apex, rather deeply striated, interstices narrow, thickly punctured and granulate; legs rather stout, tibiæ suddenly and strongly narrowed at base. L. 6–8 mm.

Male with the antennæ flabellate from the sixth joint, and the thorax distinctly channelled; female with the antennæ pectinate and the thorax channelled at base.

In rotten wood of beech and other old trees; local, but sometimes in numbers where it occurs; Chatham (Champion and J. J. Walker, in profusion); Sevenoaks; Coombe Wood; Cobham Park; Darenth Wood; Tonbridge; New Forest; Windsor Forest; Halesworth, Suffolk; Bretby Wood, near Repton (Harris); Dunham Park, Manchester (Chappell).

EUCNEMIS, Ahrens.

This genus appears to contain only one species, which is widely distributed in Europe, but has only lately been taken in Britain; the larva has been described and figured by Perris, Bonvouloir, and Cussac, but has been more accurately discussed by Dr. Sharp in the Transactions of the Entomological Society of London, 1886, Part iii. pp. 297–302; it is chiefly remarkable from the fact that there exist on the dorsal and

ventral aspects of the segments peculiar velvety patches, and behind each of these a small stigma-like cavity; it possesses no rudiments of legs and no ocelli, and the mouth, palpi, and antennæ are rudimentary and scarcely traceable; the segments are much incised, so that the outline is very undulatory; Dr. Sharp says regarding it (l. c. p. 301), "The larva of *Eucnemis capucina* has certainly the capacity of comminuting the decayed wet wood in which it lives, and I presume that it makes its burrows by a process of this kind, though I have not been able to observe how it does it; it is exceedingly slow in all its movements, and I think it is most probably by twisting and pushing a little with its head that it makes its burrows; the peculiar very hard saw-like teeth with which the whole front margin of the head is armed appear admirably adapted for this purpose. I only found larvæ in the sappy or damp wood in the interior of the tree; the outer wood was dry and comparatively hard, and was penetrated in all directions by the burrows of former generations of the larvæ; and it was in this comparatively hard outer wood that we found the perfect insects."

E. capucina, Ahr. Elongate oval, subcylindrical, black, shining, clothed with silky greyish pubescence, which is not very apparent; head convex, rather finely and thickly punctured, with a raised carina extending from front to base, antennæ entirely received in epipleural grooves of the thorax, pitchy brown, serrate, with the first and third joints elongate, and the second joint very small; thorax narrowed in front, depressed at base, basal margin sinuate on each side near posterior angles, upper surface distinctly punctured; scutellum semicircular, situated in a strong depression at base of elytra; elytra gradually narrowed behind, rounded at apex, irregularly and distinctly punctured, but without a trace of striæ; legs strongly retractile, pitchy red, with tarsi lighter. L. 4-5½ mm.

In an old beech tree near Brockenhurst, New Forest; taken in some numbers by Dr. Sharp, Mr. Champion, and the Rev. H. S. Gorham on June 13th, 1886; it has not occurred, I believe, since; the capture is most interesting as showing that we have by no means exhausted all possible discoveries of further indigenous Coleoptera, when a locality that has been so much worked as the New Forest by Turner and others is found to yield so important a species.

MICRORRHAGUS, Eschscholtz. (*Dirrhagus*, Latreille.)

This genus is one of the most extensive of the Eucnemidæ, containing, as it does, about sixty species; ten of these are found in Europe, and the remainder occur chiefly in North, Central, and South America and the Malay Peninsula; one or two species have been described from Ceylon; our single British species may be easily known from those belonging to the two preceding genera by its much longer antennæ, which are contiguous at base, and delicately pectinate in the male.

M. pygmæus, F. (*Chevrolati*, Stierl.). Black, shining, cylindrical, narrowed behind, clothed with rather fine greyish pubescence; head convex, strongly and somewhat rugosely punctured, furrowed between antennæ, with a trace of a raised keel on vertex; antennæ long, with the second joint short, black or pitchy black; thorax narrowed in front, convex, depressed towards base, with sharp posterior angles, thickly and distinctly punctured, with two round impressions on middle of disc, and further impressions at base; elytra depressed at base, narrowed towards apex, with the sutural stria distinct, and the dorsal striæ more or less evident, interstices rugosely punctured; legs slender, femora pitchy, tibiæ and tarsi reddish. L. $3-4\frac{1}{4}$ mm.

Male with the antennæ strongly pectinate; in the female they are deeply serrate.

By sweeping fern, &c.; very rare; New Forest (Turner, Power, Champion, &c.); Stephens records it doubtfully from Norfolk.

(*Cerophytidæ*. This family is distinguished from all the preceding by having the posterior coxæ not laminate and the trochanters of the middle and posterior legs very long; it is by many authors regarded as merely a tribe of the *Eucnemidæ*, and is represented in the European fauna by one genus and one species which has been recorded as British, but is very doubtfully indigenous, and cannot be admitted into our lists without further confirmation.

Cerophytum, Latr. This genus comprises four or five species from North America, Mexico, Cayenne, and Europe; it is the only genus belonging to the family.

C. elateroides, L. Oblong, subcylindrical, black, finely pubescent, mouth parts and antennæ ferruginous; head thickly and rugosely punctured, with a fine and sharp raised keel on the front; antennæ approximate at base, pectinate in male, serrate in female, palpi with the last joint securiform; thorax small, without antennal scrobes beneath, strongly and thickly punctured; elytra broadest behind middle, with punctured striæ, interstices rugosely punctured; legs reddish with tibiæ and tarsi lighter, posterior coxæ not laminate. L. 6-7 mm.

Once found in the neighbourhood of Bristol (Westwood and Stephens); very doubtfully indigenous.)

ELATERIDÆ.

This is a very large and important, and for the most part strongly defined family; its members are spread generally over the surface of the globe, but they are more widely distributed than those of the *Buprestidæ*, a considerable proportion being found in temperate and even cold countries, although the greater number of the species seem to inhabit tropical climates. In the Munich catalogue, published in 1869, about one hundred and eighty genera and two thousand seven hundred species are enumerated, but this number has been considerably

increased since that time; thirty-three genera and about three hundred and eighty species occur in Europe, of which seventeen genera, containing sixty-one species, are found in Britain; the family, therefore, is considerably better represented by indigenous species than is the case with the Buprestidæ.

The chief characteristic of the family, and that from which it derives its name (the word "Elater" being the Greek for a "driver" or "jumper"), is the power that its members possess of springing into the air when placed on their back; this is effected by depressing the head backwards so as to form a slight arch, a movement which brings the strong prosternal process to the anterior part of the mesosternal cavity; the muscles are then suddenly relaxed, and the spine descends suddenly into the cavity; by the force of this sudden movement upon the slightly arched body the base of the elytra is caused to strike the supporting surface with some violence, and the whole body is forced upwards; this property is necessarily coexistent with a loose articulation between the pro- and mesothorax, which, as pointed out by Dr. Horn and others, is a remarkable character in the majority of the genera of the family.

This power of leaping, as above shown, is also possessed by several of the Eucnemidæ, and it is on account of this, to a great extent, that many authors include them with the Elateridæ.

The following are some of the chief characters that distinguish the family:—Head usually more or less sunk in thorax, but occasionally free with the eyes prominent; eyes, as a rule, not prominent, round; antennæ pectinate, serrate, or somewhat filiform, inserted low down on the forehead, distant at base, sometimes received in grooves; mandibles bifid at apex, maxillæ with two lobes, the outer one very small, maxillary palpi with the last joint, as a rule, scuriform; prothorax loosely articulated with mesothorax, prosternum produced into a process behind which is received in an excavation in the middle of the mesosternum; anterior coxal cavities open behind; mesosternum short, metasternum usually long; elytra almost always covering the abdomen (very rarely abbreviated in the female), scutellum visible; abdomen composed of five segments; legs moderately long or short, usually slender, tarsi 5-jointed either simple or, rarely, lobed, claws simple, toothed or pectinate.

The species as a rule are sombre-coloured, and in this respect differ from the Buprestidæ; a few, however (such as *Elater sanguineus* and its allies, *Corymbites æneus*, &c.), are conspicuous; some of the exotic species attain to a very considerable size; the members of the family that are best known to the ordinary student of Natural History are the so-called "fire-flies," which are really beetles belonging to the genus *Pyrophorus*; the type species *P. noctilucus*, L., is upwards of an inch long, of an obscure brown colour, with an oval spot of a dull yellow colour near each posterior angle of the thorax; with regard to this

insect Professor Westwood (Classification i. p. 241) makes the following observations:—"These spots emit so strong a light during the night (that being the period when they are in motion, reposing by day, when they are but seldom observed), that it is easy to read the smallest writing by placing several under a glass, or by moving a single insect along the lines. They are termed by the natives Cucuyos or Coyouyou, and by the Spaniards Cucujo. When the insect is on the wing, two additional luminous patches are observed beneath the elytra, the light indeed shining out from beneath the abdominal segments when stretched out. It is said that they are attracted by the light of a flambeau, which they follow like moths, a circumstance which also occurs in glowworms."

The larvæ of the Elateridæ are very well known in many instances, in fact far too well, as they are identical with the well-known "wire-worms," which are such a pest to the gardener and the farmer; they differ from those of the Buprestidæ in not having the prothoracic segment dilated, and in the presence of legs; except in the disposition of the scuta and the formation of the anal segment they bear a strong family relation to one another, with the exception of those belonging to a few genera such as *Cardiophorus*, which are very peculiar by reason of the broad membranous spaces between the abdominal segments. The following are the chief characteristics of the larvæ as given by Chapuis and Candèze (Catalogue des Larves des Coléoptères, p. 140):—Head corneous, flat above and below, with the mouth not inferior; ocelli absent; antennæ very short, 3-jointed, inserted on the sides of the head near the mandibles; labrum not visible; mandibles short, rather strong, simple or dentate; maxillary palpi with the internal lobe only slightly developed, external lobe 2-jointed, with a short 4-jointed palpus; thoracic and abdominal segments closely resembling one another, the prothoracic segment being the longest; legs short, contiguous, terminating in a simple claw or hook which takes the place of a tarsus; abdominal segments of the same breadth as the thoracic segments, nine in number, the ninth segment variable, being sinuate or dentate at sides, and often split up at apex into dentate processes; the whole body both above and below is almost entirely protected by corneous scuta; the colour is, as a rule, reddish-brown or yellowish, some species however are blackish-brown or purplish, and very rarely the colour is yellowish-white; the larvæ, as a whole, much resemble those of the Tenebrionidæ, but may be known by their flatter head and the shape of the apical abdominal segment. Some of these larvæ are very destructive to plants, and will be noticed under their respective genera; others again are wood-feeders, and some, such as *Elater rhombeus*, are positively affirmed to be carnivorous; Chapuis and Candèze, in confirmation of the latter facts, allege that they have found an Elaterid larva devouring the larva of a species of Diptera in a decaying mushroom.

The British genera may be divided as follows; it will, however, be advisable for any student of the genus to make himself acquainted with the appearance of the genera by means of type specimens, if possible, as many of them are closely related, and the generic differences are not always very apparent from descriptions:—

- I. Antennæ short, entirely received in strong grooves beneath LACON, *Lap.*
- II. Antennæ longer, not or not entirely received in antennal grooves.
 - i. Coxal plates suddenly dilated inwards; eyes more or less sunk in thorax.

1. Margin of the front elevated behind the labrum ; size smaller.
 - A. Prosternal spine truncate behind ; scutellum cordiform ; larva with the abdominal segments widely separated by membranous divisions . . . CARDIOPHORUS, *Esch.*
 - B. Prosternal spine acute ; scutellum oval ; larva, as a rule, with the abdominal segments approximate.
 - a. Posterior angles of thorax spiniform ; prosternum broad, with sutures single . . . CRYPTOHYPNUS, *Esch.*
 - b. Posterior angles of thorax produced, but not spiniform ; prosternum moderate, with sutures double.
 - a*. Prosternal sutures excavated in front ; second joint of antennæ shorter than third . . . ELATER, *L.*
 - b*. Prosternal sutures not excavated in front.
 - a†. Antennæ strongly serrate, with the second joint much shorter than third . . . ISCHNODES, *Germ.*
 - b†. Antennæ more feebly serrate, with the second joint about equal to third . . . MEGAPENTHES, *Kies.*
2. Margin of the front not elevated behind the labrum ; second and third joints of antennæ very short . . . LUDIUS, *Latr.*
- ii. Coxal plates gradually dilated inwards.
 1. Elytra without ventral epipleuræ ; eyes more or less sunk in thorax.
 - A. Front not convex ; mouth not inferior ; * antennæ with the first joint not elongate.
 - a. Claws serrate . . . MELANOTUS, *Esch.*
 - b. Claws simple.
 - a*. Tarsi with the first joint elongate . . . ATHOUS, *Esch.*
 - b*. Tarsi with the first joint not or only slightly longer than second.
 - a†. Thorax with posterior angles short, not overlapping the shoulders of elytra ; anterior coxal cavities narrowly open behind . . . LIMONIUS, *Esch.*
 - b†. Thorax with posterior angles long, overlapping the shoulders of elytra ; anterior coxal cavities broadly open behind . . . SERICOSOMUS, *Redt.*
 - B. Front convex ; mouth inferior ; antennæ with the first joint elongate, forming a scape.
 - a. Claws pectinate.
 - a*. Tarsi with the fourth joint strongly lobed beneath ; thorax longer ; size much larger . . . SYNAPTUS, *Esch.*
 - b*. Tarsi with the fourth joint not lobed ; thorax shorter ; size very small . . . ADRASTUS, *Esch.*
 - b. Claws simple.
 - a*. Sides of thorax obtuse, margin deflexed in front ; second joint of antennæ longer than third . . . AGRIOTES, *Esch.*
 - b*. Sides of thorax acute, margin straight in front ; second joint of antennæ equal to third . . . DOLOPIUS, *Esch.*
 2. Elytra with the ventral epipleuræ narrow but

* In *Sericosomus* the mouth is deflexed and almost inferior ; the genus must therefore be regarded as an exception.

distinct, embracing the sides of the abdomen ; eyes quite free, or with the extreme posterior margin alone hidden.

- A. Eyes moderately prominent; margin of front not reflexed CORYMBITES, *Latr.*
- B. Eyes strongly prominent, always quite free; margin of front strongly and sharply reflexed CAMPYLUS, *Fisch.*

LACON, Laporte.

About one hundred and twenty species are comprised in this genus; they are chiefly found in tropical countries, only two occurring in Europe, of which one is rather common in Britain.

The larva of *L. murinus* is figured by Schiödte (Part v. pl. vi. fig. 2); it is elongate and parallel-sided, of a pale yellowish colour, with the sides white and the head, prothoracic scutum, and the ninth segment of abdomen fusco-ferruginous; the prothorax is much longer than the meso- and metathorax, and the third abdominal segment is longer than the others; the sides of head and body are furnished with long hairs; the last segment of the abdomen is nearly as broad as the preceding, serrate at the sides and terminated by two strong bifid points which represent the cerci; the legs are visible from above.

L. murinus, L. A rather large broad species, black or dark brown, thickly clothed with light and dark brown and greyish tomentose pubescence, which gives the upper surface a variegated appearance; head rather convex, punctured, antennæ rather short, entirely received in grooves beneath, yellow with the first joint black; thorax a little longer than broad, convex in centre and depressed and uneven towards base, with the posterior angles very blunt and truncate, upper surface distinctly and closely punctured on disc, more closely at sides; scutellum large; elytra much depressed at base, gradually narrowed to apex, broadest in or about middle, with very feeble and feebly punctured striæ, interstices finely punctured; legs pitchy or pitchy red, knees and tarsi light red. L. 9-14 mm.

Grassy places by sweeping; occasionally in moss, garden refuse, &c.; often on the wing; common and generally distributed in the London, Southern, and Midland districts; less common further north; Snowdon; York; Manchester; Northumberland and Durham district; Scotland, scarce, Lowlands, Tay district; Ireland, near Dublin, local; Furnish Island (co. Galway).

CARDIOPHORUS, Eschscholtz. (*Caloderus*, Steph.)

More than two hundred species are known as belonging to this genus, of which fifty are found in Europe; the rest are very widely distributed, and range from Siberia to Madagascar and the Cape of Good Hope, although the majority appear to be found in temperate countries; the genus is distinguished by its very convex thorax, the comparatively short posterior angles of the same, and the cordate scutellum; the

prosternal process is truncate behind, and the anterior coxal cavities are rather narrowly open.

The larva of *Cardiophorus asellus* is described and figured by Schiödte (Part v. p. 494, fig. iv. 1-10); it is very long, slender and filiform, and is chiefly remarkable for the very great proportional length of the abdomen, which is due to the fact that the abdominal segments, which are transverse and much broader than the thoracic segments, are separated by retractile membranous joints, the space occupied by these between each segment being longer than the segment; the ninth abdominal segment is narrow, with a tuft of hairs at apex and a reflexed hook on each side; the head is oblong with bifurcate mandibles, scarcely narrower than the thoracic segments, which are very small in comparison with the rest of the body; the legs are moderately long and plainly visible from above; the colour is white, with the thoracic segments flavescent, the head ferruginous, and the mandibles fuscous.

There are four species, which have been reputed as British, but three of these are doubtfully indigenous, and require further confirmation before they can be received with any certainty.

C. asellus, Er. (*equiseti*, Steph., nec Herbst.). Of a greyish-black colour, somewhat thickly clothed with rather long recumbent greyish pubescence, thorax moderately shining, elytra dull; form somewhat resembling that of *Agriotes sputator* and its allies; head thickly punctured, with vertex impressed, antennæ black, gradually narrowed to apex; thorax very convex, with sides rounded, thickly and very finely punctured, posterior angles short and blunt; scutellum large, cordiform, with a deep impression; elytra somewhat depressed and uneven on disc, subparallel until posterior third and thence narrowed to apex, with distinct punctured striæ, interstices very thickly punctured, dull; legs black, knees and tarsi lighter, claws simple. L. 6-8 mm.

Sandy places; at roots of grass and by sweeping herbage; very local and, as a rule, rare; occasionally, however, it has been taken in some numbers, Esher, Faversham, Frensham, Woking, Chobham, Birch Wood, Darenth Wood; Weymouth and Portland; Chesil Beach, common, May 1886 (J. J. Walker); Gleanvilles Wootton; Bristol; Scotland, Edinburgh (Stephens); the latter record may have been in error, as it has not since occurred in Scotland or in any district in the Midlands or North of England.

(*C. ruficollis*, Er. Shining black, indistinctly clothed with greyish pubescence, upper surface of thorax red, with the anterior portion black, under surface of the same red with the anterior edge and a longitudinal streak, black; head finely punctured; thorax as long as broad, not very convex, thickly and finely punctured; elytra broader than thorax with strong punctured striæ, interstices somewhat convex, punctured and transversely wrinkled, upper surface black or bluish-black, under surface black; legs black, tarsi more or less brownish. L. $5\frac{1}{2}$ mm.

Recorded by Stephens from the neighbourhood of London, and also as having been found on the oak in Norfolk.

C. thoracicus. Er. Black, very shining, with bright red thorax,

clothed with very scanty greyish pubescence; head finely punctured, antennæ black; thorax as long as broad, convex, narrowed in front, finely and thickly punctured, under-side with a longitudinal black streak in the middle; elytra with punctured striæ, interstices finely and thickly punctured; legs black, apex of tibiæ, claws, and more or less of tarsi, reddish. L. 7 mm.

Stephens gives the following record of this insect, which is remarkable, as it has certainly not been taken for very many years:—"Rare, but widely distributed, occurring within the metropolitan district, in Norfolk, Somersetshire, &c.; Baron Wood, Cumberland, T. C. Heysham, Esq.; Windsor, Dr. Leach; New Forest, L. Rudd, Esq.; Collingbourne Wood, Rev. G. T. Rudd."

C. rufipes, Fourc. Somewhat depressed, black, upper surface clothed with very fine blackish pubescence; head thickly and rather finely punctured, antennæ longer in male than in female, black; thorax, as a rule, longer than broad, broadest in middle, very finely and thickly punctured; elytra a little broader than thorax, with strong punctured striæ, interstices convex, punctured; femora and tibiæ reddish-testaceous, tarsi pitchy, the base of each joint and the claws being red. L. $5\frac{1}{2}$ – $6\frac{1}{2}$ mm.

A single specimen was found by Mr. John Dunsmore in 1875 by sweeping rank grasses at Corkendale Law, the highest peak in Renfrewshire, about six miles from Paisley. Dr. Sharp, however, considers that farther captures must be made before the species can be considered a native one.)

CRYPTOHYPNUS, Eschscholtz.

This genus is more characteristic of temperate and northern countries than perhaps any other genus belonging to the family; it contains about seventy species, very few of which occur in tropical climates, although four or five have been described from Burmah, Borneo, Java, Para, &c.; the northern range of the genus, however, is very wide, as it stretches across Northern Europe and Siberia to Kamtschatka and Alaska, and is probably generally distributed over the northern hemisphere. The species vary considerably in size and appearance, and Thomson divides them into three genera, *Cryptohypnus*, *Negastrius*, and *Zorochros*, the first of which he classes with the Elaterina, and the two last with the Cardiophorina; the genus as a whole may be known by the spiniform posterior angles of thorax, and by the carina of the same angles being large and distinct and parallel to the side margin. Twenty-seven species are found in Europe, of which six occur in Britain; these may be divided as follows:—

- I. Thorax with the carinæ of the posterior angles ceasing before middle; size larger.
 - i. Thorax shorter, not rugose; elytra unicolorous.
 - 1. Upper surface and legs black; size smaller; first joint of antennæ shorter than third joint *C. MARITIMUS*, Curt.

- 2. Upper surface bronze, legs red; size larger; first joint of antennæ longer than third joint C. RIPARIUS, F.
- ii. Thorax longer, strongly rugose; elytra with yellow markings C. SABULICOLA, Boh.
- II. Thorax with the carinæ of the posterior angles reaching beyond middle; size smaller.
- i. Prosternum without furrow.
 - 1. Elytra with several variable yellow spots at base and towards apex C. PULCHELLUS, L.
 - 2. Elytra with two well-marked large yellow spots on each, one at base and the other before apex C. QUADRIPUSTULATUS, F.
- ii. Prosternum with lateral furrow in front; elytra immaculate or with two small yellow spots on each, one at base and the other before apex . . . C. DERMESTOIDES, Herbst.
(v. *quadriguttatus*, Lap.)

C. maritimus, Curt. (*Scotus*, Cand.). Elongate and rather narrow, black, with a very slight, almost imperceptible, metallic reflection, clothed with very fine greyish pubescence; head very closely punctured, antennæ long and slender, first joint shorter than third, second joint very short, third and fourth joints nearly equal; thorax somewhat longer than broad, very closely and finely punctured with more or less distinct traces of a smooth central line in middle; elytra with deep striæ, interstices very closely punctured; prosternal process only covering base of mouth parts; legs black with tarsi pitchy. L. 4–4½ mm.

On the banks of rivers and streams; very local; Llanberis; Bettws-y-coed; Heysham and Lancaster district; Cumberland; Northumberland and Durham district; Scotland, Solway, Tay and Moray, and probably Clyde and Dee districts.

C. riparius, F. Much larger and broader than any of our other species, ovate, convex, of a dark bronze colour, very sparingly clothed with yellowish pubescence; head convex, coarsely punctured, with a furrow or depression on vertex, antennæ pitchy with base lighter, first joint large, second third and fourth of about equal length, the rest shorter and broader; thorax very convex in middle, depressed strongly at base, broadest just behind middle, diffusely and finely punctured on disc, more thickly at sides; scutellum large, rounded; elytra about twice as long as together broad, broadest in middle, with distinct impunctate striæ, interstices flat, very finely and diffusely punctured; under-side black; legs reddish-yellow with pitchy femora. L. 5–6 mm.

On the banks of streams, &c.; under stones and pieces of wood, also in flood refuse; common and generally distributed from the Midlands to the extreme north of Scotland; not uncommon in the London district, but apparently rare in the south of England; Ireland, near Belfast and Dublin; co. Cork; Westport, co. Mayo; Teelin Bay, Donegal, &c.

C. sabulicola, Boh. (*Negastrius sabulicola*, Thoms.). Elongate, rather narrow, black, somewhat dull, elytra with irregular patches at base and before apex, and a round spot on each behind middle yellow;

head thickly punctured, antennæ comparatively short, dark with base reddish-testaceous, first joint large, second and third joints nearly equal; thorax distinctly longer than broad, gradually narrowed in front, broadest behind middle, strongly rugose, with a narrow and somewhat raised smooth central line; carinæ of posterior angles extending for about one-third the length of the thorax; elytra with sides slightly rounded and gradually narrowed to apex, very strongly striated, interstices thickly and distinctly punctured, convex, almost carinate towards base; legs yellow, femora fuscous in middle. L. $3\frac{1}{2}$ –5 mm.

On the banks of streams; rare; banks of the Nith, Thornhill (Sharp), and at Dumfries (Lennon).

C. pulchellus, L. (*Negastrius pulchellus*, Thoms.). Strongly convex, black with irregular yellow markings on elytra, thickly and rugosely punctured, dull, with very fine and short pubescence which gives the upper surface a somewhat leaden appearance; head very thickly punctured, antennæ black with base yellowish, second and third joints of about equal length; thorax longer than broad, strongly convex, rugosely punctured, with the lateral keels extending beyond middle, and with traces of a feeble smooth raised line; elytra half as long again as thorax with strong striæ, interstices almost carinate as far as middle; legs entirely yellow; the yellow markings on the elytra are very irregular: in the type form there is a trilobed spot at base, a round spot behind middle, and some smaller spots at apex. L. $2\frac{1}{2}$ –4 mm.

On the banks of rivers and streams; very rare; on the banks of the Findhorn, Morayshire (Hislop); the species, according to Rye, is spread over the whole of Europe, on river banks, living under stones and at the roots of plants, especially of *Triticum repens*, on which, according to Lacordaire, its larva feeds; it is also recorded from America.

C. quadripustulatus, F. (*Negastrius 4-pustulatus*, Thoms.). A very small and proportionately broad species; black, with the posterior angles of thorax and two large and well-marked spots on each elytron yellow, upper surface finely pubescent; head rather thickly punctured, antennæ as long as head and thorax, lighter or darker brown with lighter base; thorax as long as broad, strongly convex, depressed towards base, strongly rounded at sides, finely punctured; elytra elongate oval, more than twice as long as thorax, with rather deep and not very plainly punctured striæ, interstices thickly and finely punctured; prosternal process only covering base of mouth parts; legs yellow. L. 3 mm.

In damp grassy places; by sweeping, &c.; local; London district, scarce but rather widely distributed, Lee, Dulwich, Penge, Forest Hill, Battersea Fields, Clapham, Putney, Cowley, &c.; Wicken and Burwell Fens, Cambridge; Barnstaple; Bristol; Tewkesbury; Bewdley; Knowle; Salford Priors; Church Stretton; Repton; Lancaster; Northumberland district, Banks of Till, Whitley, and Hetton Hall, Belford; Ireland, near Belfast.

C. dermestoides, Herbst. (*Zoroachros dermestoides*, Thoms.). Black, unicolorous, finely pubescent, rather depressed; head thickly punctured, antennæ long and thin, black with base lighter, second and third joints of about equal length; thorax about as broad as long, rather strongly convex, with sides rounded, very finely and somewhat rugosely punctured, with the lateral carinæ extending beyond middle, and with more or less distinct traces of a smooth central line; elytra rather finely striated, with the interstices finely and obsoletely punctured; legs yellowish-red, with tibiæ often darker. L. 2–3 mm.

On the banks of streams, in gravel, under stones, &c.; local, but common in many high and northern districts; Bewdley; Church Stretton; Llangollen; Capel Curig and Snowdon district generally; Repton; Ripon; Scarborough; Lancaster district; Northumberland and Durham district, common; Scotland, common, Solway, Forth, Tay, Dee, Moray, and probably other districts; Ireland, near Dublin and Killarney.

V. quadriguttatus, Lap. (*C. tetragraphus*, Germ.). This variety has two small spots on each elytron, one at base and another before apex; it may easily be known from *C. quadripustulatus* by the spots on elytra being much smaller, and by not having the posterior angles of thorax reddish-yellow, but unicolorous with the rest of the thorax.

Found under the same circumstances and in company with the type form in the same localities.

ELATER, Linné.

This genus contains about a hundred species, of which very few are found in tropical countries; they have a very wide range, extending from Siberia and Lapland in the north to Patagonia in the south; a large proportion of the species occur in North America; twenty-seven have been met with in Europe, of which eleven are found in Britain: the larvæ do not appear to call for any particular remark; they differ to a certain extent among themselves in punctuation, and in the form of the last abdominal segment; as they are nearly always found in decaying trees, they are not destructive to crops. In structure and sculpture the species are very closely allied, and it is therefore better to tabulate them by their colour for the sake of identification; the posterior angles of the thorax are projecting and carinate in all the species.

I. Elytra bright scarlet, unicolorous.

i. Thorax shorter, less parallel-sided, and more shiny.

1. Pubescence black; central furrow of thorax traceable throughout

E. SANGUINEUS, L.

2. Pubescence rufescent or pale fuscous; central furrow of thorax only visible at base

E. LYTHROPTERUS, Germ.

ii. Thorax longer, more parallel-sided, and duller

E. COCCINATUS, Rye.

II. Elytra bright scarlet, as a rule marked with a large common elongate black spot; central furrow of thorax entirely wanting or very feebly marked at base

E. SANGUINOLENTUS, Schr.

III. Elytra bright scarlet, with the extreme apex more

- or less distinctly black; central furrow scarcely marked at base *E. POMONÆ*, Steph.
- IV. Elytra unicolorous brownish-red; pubescence fuscous *E. POMORUM*, Herbst.
- V. Elytra brick-red or brownish-red, with apex black.
- i. Apex of elytra only black; form more acuminate behind; size smaller *E. ELONGATULUS*, F.
- ii. Apical third of elytra black; form less acuminate behind; size larger *E. BALTEATUS*, L.
- VI. Elytra black, with margins and a longer or shorter patch at base and behind scutellum brownish-yellow *E. TRISTIS*, L.
- VII. Elytra entirely black.
- i. Form smaller and narrower; antennæ shorter and more slender; interstices of elytra plainly rugose *E. NIGRINUS*, Payk.
- ii. Form larger and broader; antennæ longer and stouter; interstices of elytra punctured, scarcely rugose *E. ÆTHIOPS*, Lac.

***E. sanguineus*, L. (*rufipennis*, Steph.).** Black, with bright scarlet elytra, clothed with black pubescence; head thickly punctured, antennæ black, sometimes pitchy brown towards base; third joint almost double as long as second; thorax about as long as its breadth at base, rather strongly and moderately closely punctured on disc, much more thickly at margins, depressed at base, with an impressed central line traceable throughout; elytra with distinct punctured striæ, interstices distinctly, although finely and not closely punctured; legs black, tarsi and apex of tibiæ reddish or pitchy red. L. 10–12 mm.

Under bark and in decayed wood; very rare; New Forest; also recorded by Stephens from the West of England and Bagley Wood, Oxon; according to Erichson and Thomson, it is chiefly confined to pine and fir trees ("Nadelholzern," Er.; "Barrsköga," Thoms.).*

***E. lythropterus*, Germ. (*sanguineus*, Steph., *nec* L.; *semiruber*, Steph.).** Very closely allied to the preceding, but easily distinguished by the colour of the pubescence, which is pale, of a yellowish-red or light fuscous colour, and by the fact that the central channel of the thorax is only apparent towards base; the punctuation of the thorax appears to vary somewhat in different specimens, but is, on the whole, a little closer on disc than in *E. sanguineus*, and the thorax itself is a little longer proportionally; in the latter species the striæ of the elytra are rather strongly marked at base, and one or two, at all events, are continued without punctures to base; in *E. lythropterus*, however, they distinctly cease a little before base, and are not so strongly marked; legs black, with tarsi ferruginous. L. 10–11 mm.

In decaying oaks and birch; also on the wing, over bracken, &c.; local, but not uncommon in the New Forest, where it has sometimes been taken in numbers; it has

* It is a pity that we have no exact words in English to express the German "Nadelbaume" and "Laubbaume" ("needle trees" and "leaf trees"), and the Swedish "Barrtrad" and "Loftrad."

also been recorded from Highgate and Coombe Woods, Salisbury, Windsor, Barmouth, and Crymlyn Bog, Swansea; it may be found in early spring by breaking open the dead and decaying branches that have fallen from the oaks, &c., in the winter, or in dead trunks lying on the ground; the insect is often found at some distance from the surface of the wood, and the small logs and boughs require to be carefully split open and examined.*

E. coccinatus, Rye. This insect, according to Mr. Rye, who separated the species, differs from all the other species with scarlet elytra through its narrow parallel shape, long, parallel, duller and densely punctured thorax, and the slight striæ and flat interstices of its elytra; the pubescence of the upper surface is brownish. Mr. Rye remarks that it most closely resembles the immaculate form of *E. sanguinolentus*, but may be readily separated from that insect by its longer antennæ, longer, duller and posteriorly canaliculated thorax, &c. L. 11–12 mm.

In oaks, &c.; very rare; Kensington Gardens and Windsor Forest (Rye); Sherwood Forest (Blatch); it appears to be doubtful whether it has occurred in the New Forest; it has been taken in oaks in France in the Forest of Fontainebleau by M. Bedel and M. Grouvelle.

E. sanguinolentus, Schr. (*coccineus*, Schiödte; *ephippium*, Ol. Black, with scarlet elytra, which are almost always furnished with a long common black spot, but are occasionally immaculate; pubescence greyish or greyish-yellow; the form is a little narrower and more parallel than in *E. sanguineus* or *lythropterus*; immaculate specimens, as a rule, have the suture narrowly black in the middle, but they may further be distinguished from the two species just mentioned by their shorter and more convex thorax, which is more plainly sinuate before posterior angles, and presents scarcely a trace of a central furrow even at base, and further by the fact that the pubescence on the head consists of pale and black hairs intermingled. L. 8–11 mm.

At the roots of heath; on nettle flowers; by beating trees, &c.; local, and usually rare; Darenth Wood, Wimbledon, Richmond Park, Epping Forest; New Forest; Salisbury; Christchurch; Oxford; Bewdley Forest.

E. pomonæ, Steph. Very closely allied to *E. lythropterus*, from which it differs by the pubescence being black (sometimes dark fuscous on elytra), and by having the extreme apex of the elytra blackish; from *E. sanguineus* it may be distinguished by the latter character, and also by the absence of a central furrow on thorax, which is scarcely, if at all, traceable even at base; from the immaculate form of *E. sanguinolentus* it may also be known by having the thorax rather less convex, the joints of the antennæ slightly longer, and the elytra a little flatter. L. 9–11 mm.

* The only Scotch record for this species, "Raehills, in decayed birch trees during winter; very rare, Rev. W. Little," is considered by Dr. Sharp to be probably erroneous, the species referred to being possibly *E. pomorum*.

Very rare ; New Forest (Turner) ; Stephens records it from Darenth Wood and Barmouth.

E. pomorum, Herbst. (*ferrugatus*, Lac. ; *crocatus*, Steph., nec Lac. ; *ochropterus*, Esch.). Black, with the elytra of a dark brownish-red colour, sometimes lighter at extreme base, clothed with fuscous pubescence ; head thickly and distinctly punctured, antennæ black with second and third joints lighter or darker pitchy, third joint longer than second, but plainly shorter than fourth ; thorax about as long as broad at base, distinctly but not very closely punctured on disc, more closely at sides, depressed at base, with central furrow absent or only indicated at base ; elytra with the pubescence rather lighter than on thorax, with distinct punctured striæ, interstices somewhat convex, punctured ; legs black, tarsi pitchy red. L. 8–10 mm.

Under bark and in decayed branches of deciduous trees ; very local ; Dean Forest in considerable numbers (Hodgson) ; Cannock Chase (Blatch) ; Sherwood Forest in oaks, &c. (Blatch, Turner, and others) ; Scotland, very rare, Tay and Dee districts ; Ireland, one specimen in a birch tree at Churchill, co. Armagh (Rev. W. Johnson).

E. elongatulus, F. (*præustus*, Steph.). The smallest of our species with red elytra ; black, with the elytra brick-red except apex which is distinctly black, upper surface clothed with blackish or fuscous pubescence ; antennæ black, with the second and third joints pitchy brown or pitchy red, third joint hardly longer than second and very much shorter than fourth ; thorax somewhat longer than broad, rather sparingly punctured on disc, more closely at sides, pubescence blackish, depressed at base, with central furrow absent or scarcely traceable at base ; elytra acuminate behind, with deep punctured striæ, interstices punctured and clothed with dark hairs ; legs black, tarsi pitchy reddish. L. 6–7 mm.

In decaying oaks ; rare ; Darenth Wood (Power) ; New Forest ; Shirley Warren, Southampton (Gore) ; Nuthurst, Sussex (Stephens).

E. balteatus, L. Black, elytra red with the apical third black, upper surface clothed with fine greyish pubescence ; head closely punctured, antennæ with the third joint longer than second and not much shorter than fourth ; thorax longer than broad, feebly narrowed in front, rather thickly and finely punctured ; elytra subparallel to posterior third and thence very gradually narrowed to apex, with punctured striæ, interstices slightly convex and rather thickly and distinctly punctured ; legs black, tarsi pitchy red. L. 7–8 mm.

By beating birches, &c. ; occasionally in rotten wood of oak and birch, where it passes its earlier stages ; local, but not uncommon in many localities, and sometimes abundant where it occurs ; Darenth Wood, Birch Wood, Shooter's Hill, Richmond Park, Coombe Wood, Forest Hill, Esher, Mickleham, Weybridge, Leith Hill ; Abbey Wood ; Devon ; Barmouth ; Bewdley Forest ; Sutton Park, Birmingham ; Cannock Chase ; Chartley Moss, Staffordshire ; Windsor ; Lincoln ; York ; Ripon ; Scar-

borough; Chat Moss; Northumberland and Durham district; Scotland, local, Solway, Forth, Clyde, Tay, and Moray districts.

E. tristis, L. Black, with the base and outer margins of elytra and a large longitudinal patch behind scutellum reaching to about the middle of a dirty yellowish or brownish-yellow colour; upper surface clothed with blackish pubescence; head thickly punctured, antennæ fuscous with base a little lighter, feebly serrate; thorax about as long as broad at base, narrowed in front, thickly and distinctly punctured, with a fine and more or less distinctly traceable longitudinal furrow; elytra gradually narrowed towards apex, with punctured striæ, interstices coarsely punctured and transversely rugose; legs black or pitchy with the tibiæ lighter, and the tarsi reddish; the yellowish colour on elytra is somewhat variable in extent. L. 7 mm.

In mountainous districts, under bark of spruce fir; very rare; Scotland, Highlands, Tay district (Rannoch).

E. nigrinus, Payk. Black, unicolorous, shining, clothed with fine greyish or greyish-brown pubescence; head thickly and distinctly punctured, antennæ pitchy, rather slender, feebly serrate, third joint conical, about twice as long as second; thorax narrowed in front, somewhat convex, finely and rather sparingly punctured on disc, more closely at sides, posterior angles short; elytra with distinct punctured striæ, interstices punctured and very distinctly rugose transversely; legs pitch-brown with tarsi lighter. L. 5-6½ mm.

Under bark of pine and fir; occasionally in oaks; rare; Tooting Common (S. Stevens); Cobham; Burnt Wood, Staffordshire (Chappell); Scotland, local, Highlands, Tay, Dee, and Moray districts (Aviemore, Rannoch, &c.).

E. æthiops, Lac. (*scrofa*, Germ.; *rufitarsis*, Desv.). This species is allied to the preceding, but is larger and broader, with the antennæ longer and stouter; the third joint of the latter is cylindrical, double as long as the second; thorax hardly shorter than broad at base, moderately thickly and coarsely punctured; elytra with punctured striæ, interstices somewhat convex, punctured, but scarcely transversely rugose; legs black with tarsi reddish or pitchy; the general form and coarser punctuation as well as the larger size will easily separate this species from the preceding. L. 10 mm.

Under bark of deciduous trees; rare; Windsor Forest (Desvignes and Turner).

ISCHNODES, Germar.

This genus has by many authors been included under *Megapenthes*, from which it may be at once distinguished by the more strongly serrate antennæ, of which the second joint is very small and very much shorter than the third joint; the genus contains one European species which is very rare in Britain.

I. sanguinicollis, Panz. Elongate, narrowed in front and behind, clothed with blackish pubescence, colour shining black with the thorax bright red; head coarsely punctured, antennæ rather long, black or pitchy, strongly serrate; thorax gradually narrowed from base to apex, much narrower in front than at base, finely and not closely punctured, posterior angles sharply projecting and finely carinate; scutellum large, closely punctured; elytra gradually narrowed from base to apex, with distinct punctured striæ, interstices rather thickly and coarsely punctured, somewhat rugose; legs black or fuscous, tarsi often reddish. L. 8-9 mm.

In rotten elm, oak, maple, &c.; very local and, as a rule, rare, but it has occasionally been found in numbers; Blackheath (West); Sheerness; Esher (Power) in black fungus on old elm; Stockwell, Surrey; Greenwich; banks of the Isis near Oxford, in rotten wood, and Sutton (Surrey) flying (Rev. A. Matthews); Stephens records it from Kensington Gardens, Copenhagen Fields, Southend, Norfolk, and Windsor.

MEGAPENTHES, Kiesenwetter.

Both this and the preceding genus are distinguished from *Elater* by not having the prosternal sutures excavate in front; from *Ischnodes* the present genus may be at once known by having the second and third joints of the antennæ very small and of about equal size, and the thorax more parallel-sided; the genus contains about forty species, which are very widely distributed, but occur chiefly in tropical countries; four of these inhabit Europe, of which two are found very rarely in Britain; these may be distinguished as follows:—

- I. Upper surface dull; thorax shagreened between punctures M. LUGENS, Redt.
- II. Upper surface shining; thorax rather diffusely punctured on disc, more closely at sides, not shagreened between punctures M. TIBIALIS, Lac.

M. lugens, Redt. (*Ectinus aterrimus*, Curt., nec L., Steph., &c.; *Ampedus anthracinus*, Dej.). Elongate, gradually narrowed towards apex, deep black, very dull, clothed with thin greyish pubescence; head closely punctured, antennæ in both sexes longer than the head and thorax; thorax considerably longer than broad, with sides subparallel, but gradually rounded and narrowed in front, posterior angles sharp and projecting, very strongly carinate, upper surface covered with small fine and shallow setigerous umbilicate punctures, interspaces shagreened and dull; scutellum rather large, pointed at apex, thickly punctured; elytra not quite as broad as thorax with the sides straight gradually narrowed to apex, with distinct coarsely punctured striæ, interstices rather strongly punctured; legs pitchy black or pitchy brown, with the tarsi and knees often reddish. L. 8-10 mm.

Male with the antennæ more strongly serrate than in female.

In decaying timber, &c.; very rare; Highgate (Janson); Stockwell, Surrey (Montague); Mickleham (Marsh, one example on nettle bloom).

M. tibialis, Lac. (*Ampedus subcarinatus*, Germ.). This species may at once be distinguished from the preceding by its much more shining appearance and the sculpture of the thorax; it is also more parallel-sided and less convex; colour black, rather shining, clothed with thin greyish pubescence; head rather thickly and strongly punctured, antennæ feebly serrate, black or pitchy; thorax longer than broad, gradually rounded and narrowed in front, with posterior angles strongly projecting and carinate, central furrow rather distinct, punctation distinct, more sparing on disc, thicker at sides; scutellum large; elytra with rather strong punctured striæ, interstices less coarsely sculptured than in the preceding species; femora pitchy, tibiæ and tarsi ferruginous or reddish-testaceous; under-side of abdomen clothed with yellowish pubescence. L. 6–8 mm.

Male with the antennæ considerably longer than in female.

In decaying oaks; very rare; Richmond Park (Champion); Black Park, May 24th, 1857 (Wallace); Tooting Common (Stevens); Wanstead (Janson); Windsor (Griesbach).

LUDIUS, Latreille.

This genus contains about thirty species, which are very widely distributed, representatives having been recorded from Alaska, Oregon, Texas, Mexico, Cayenne, and Chili, as well as from Central Asia, Ceylon, Java, Celebes, and the Australian region; three are found in Europe, of which one has been found in Britain; it is one of the largest and finest of our Elateridæ, and one of our rarest indigenous insects; it may be known by its large broad form and ferruginous colour, the very short and almost equal second and third joints of the antennæ, and the fact that the margin of the front is not elevated behind the labrum.

The larva of *L. ferrugineus* is described by Schiödte (Part v. p. 514); it much resembles those of certain species of *Elater*, and occurs in decaying wood.

L. ferrugineus, L. A very large broad and rather dull species; head black, thorax rufo-ferruginous, with the base and angles black; elytra ferruginous; under-side entirely black; pubescence of upper surface fine but moderately close, yellowish, of under-side very fine and scanty, greyish; head thickly and rather strongly punctured, antennæ black, short, rather strongly serrate from the fourth joint, second and third joints very short, about equal, last joint long and pointed; thorax broad, with sides gradually rounded and narrowed from base to apex, very thickly punctured, with slight traces of a central furrow, posterior angles long and sharply projecting, and strongly carinate, but not divaricate; scutellum oblong, thickly punctured; elytra broadest about

base, narrowed and rather acuminate at apex, with rather fine punctured striæ, interstices distinctly punctured; legs black, tarsi sometimes reddish; the disc of the thorax is sometimes black, and occasionally the whole thorax is black; the latter is the *v. occitanicus*, Villers; very rarely the whole insect is entirely black. L. 14–16 mm.

In decayed trees; very rare; Hyde Park, London (Rev. A. Matthews);* Richmond Park, Darent Wood, Windsor, Clengre, and Bottisham (Stephens); Swansea, in old willow (Dillwyn); the latest capture appears to have taken place in July, 1858, when a specimen was taken by a schoolboy on a poplar by the river Cam between Cambridge and Grantchester, which was afterwards in the collection of Mr. T. Brown, of Cambridge; a few specimens are recorded as having been taken at Chesterton near Cambridge, and at Bottisham, on walnut.

MELANOTUS, Eschscholtz.

This genus contains considerably more than a hundred species, of which a large proportion occur in tropical countries; twenty-one, however, are found in Europe, and the genus is well represented in North America, but appears to be almost wanting in Asia; they are, as a rule, rather large dark-coloured insects, and may be known from the allied genera by their serrate tarsal claws; the forehead is obtusely produced in front; the antennæ have the second and third joints short and nearly equal; the ventral epipleuræ are wanting, and the eyes are more or less sunk in the thorax.

The larva of *M. castanipes* is described and figured by Schiödte (Part v. p. 513, pl. vii. fig. 1); the pupa is also figured on the same plate; the larva is large and broad, quite linear, with the head transverse, with powerful mandibles and very short antennæ, and the ninth segment of abdomen longer than is usual in the allied genera, sinuate at sides and contracted to apex, where it terminates in a blunt point; there is a deep channel all down the back of the thoracic and abdominal segments; the muscular impressions are small, dark, and elliptical, and are situated on each side of the anterior margin of the segments, the prothoracic excepted; the legs are very short; the body is furnished on each side with small bunches of long setæ on every segment; the pupa is long, and terminates in two distinct cerci, but does not call for any particular comment; the larva and pupa are found in decaying trees or stumps.

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|---|--------------------------------|
| I. Antennæ stouter; sculpture coarser; scutellum quadrate | M. PUNCTOLINEATUS, <i>Pel.</i> |
| II. Antennæ more slender; sculpture less coarse; scutellum oblong. | |
| i. Elytra shorter, more narrowed towards apex in male; average size smaller | M. RUFIPES, <i>Herbst.</i> |
| ii. Elytra longer, less narrowed towards apex in male; average size larger | M. CASTANIPES, <i>Payk.</i> |

* Mr. Matthews writes to me as follows concerning this specimen:—"One day when I was in London, Turner told me that he had seen a man employed in cutting up wood in Hyde Park, who had what he called 'a big brown snap,' but that it had been crushed flat by the wood; I told him to get it and bring it to me, which he did on the following day; it was crushed as flat as a shilling, and wrapped up in part of an old letter; I soaked it in water for some time, and then stuffed it with cotton and restored it to shape, and it is now a very good specimen."

M. punctolineatus, Pel. (*niger*, F.; *Ectinus aterrimus*, Steph., &c.). Rather broad, subcylindrical, convex, black, dull, clothed with fine and rather thin greyish pubescence; head and thorax coarsely and very thickly punctured, antennæ black, rather short and stout, pubescent, second and third joints short, the third, however, longer than the second; thorax about as broad as long, with sides subparallel behind, rounded and gradually narrowed in front, more rounded in female than in male, with a narrow raised central line and traces of a broad central furrow at base, posterior angles straight, sharply prominent and carinate; scutellum quadrate, thickly punctured; elytra subparallel, very gradually narrowed behind, more dilated in female than in male, with rather coarse punctured striæ, interstices plainly punctured and somewhat rugose; legs black, tibiæ and tarsi sometimes reddish. L. 11–13 mm.

Sandy places; at roots of grass, &c.; not common; Wimbledon; Pegwell Bay (Matthews); Deal (where it has been taken by many collectors in some numbers); Dover (C. G. Hall); Stephens records it from Twickenham, Swansea, and Windsor.

M. rufipes, Herbst. (*fulvipes*, Herbst. and Steph., *nec* Gyll.; *bicolor*, F.). Elongate, pitchy black or pitchy brown, with the thorax often reddish at margins, upper surface clothed with fine greyish pubescence, which is rather long on the head and thorax, and shorter on the elytra; head thickly punctured, antennæ rather long, pubescent, ferruginous, varying a little in the sexes, with second and third joints short; thorax about as long as or a little longer than broad, more thickly punctured at sides than on disc, with sides rounded and narrowed in front, posterior angles projecting and strongly carinate; scutellum oblong, depressed, thickly punctured; elytra three times as long as thorax, gradually narrowed to apex, with rather weak, but distinctly punctured, striæ, interstices finely punctured; legs ferruginous. L. 10–16 mm.

Male with the thorax narrower and less rounded at sides, the third joint of the antennæ longer, and the elytra more gradually and strongly narrowed to apex and less parallel; the pubescence also of the antennæ is longer and thinner than in the female.

In rotten wood; frequently on the wing; rather common and generally distributed throughout the greater part of England; Scotland, local, Solway, Forth, Tay, and Dee districts; Ireland, near Dublin, local.

M. castanipes, Payk. (*obscurus*, F.; *fulvipes*, Gyll., *nec* Herbst.). Larger and broader than the preceding, and with the elytra longer, three and a half times as long as the thorax; the average colour also appears to be lighter; the sides of the thorax are less evenly rounded, the striæ of the elytra are stronger, and the interstices more strongly punctured; the male has the thorax less strongly narrowed in front and the elytra less acuminate behind; the lateral margins of the thorax are subangulate in both sexes; the species is very closely allied to *M. rufipes*, and in many collections is represented merely by one sex of the latter species.

In decaying wood; Tonbridge (Horner); Llangollen (Chappell); there were specimens also in Mr. Trueman's Sherwood Forest collection; Scotland, Tay district, Aviemore and Rannoch (Foxcroft, &c.)

ATHOUS, Eschscholtz.

This genus contains upwards of two hundred species, which are almost entirely confined to the temperate and cold countries of the northern hemisphere; of these one hundred and eleven are found in Europe, of which only eight occur in Britain; two or three of these are very rare, but *A. hæmorrhoidalis* (= *A. ruficaudis*, Steph.) is one of our commonest beetles, and its larva, which does not call for any particular remark, sometimes commits considerable ravages in pastures and cornfields.

The larva of *A. rhombeus* is described and figured by Schiödte (Part v. p. 523, pl. ix. fig. 12); it is less parallel-sided than is usually the case with its allies, and has the segments of the abdomen a little narrowed in front and behind, so that the sides are not even; it is, however, chiefly remarkable for the fact that the dorsal scuta of all the segments, with the exception of the prothorax, which is longer and not so broad as the following, are very coarsely punctured, the punctures being large and often more or less confluent; the mandibles are very strong and projecting, and the ninth abdominal segment is large, armed with short blunt teeth at sides, and terminated by two short bifurcate cerci; the colour is pale yellowish, with the head and dorsal scuta fuscous. The larva is carnivorous, and lives in decaying trunks of ash and beech, where it devours the larvæ of Lepturæ and other beetles.

The British species may be divided as follows; it is, however, rather hard, in one or two cases, to describe the differences very distinctly, as they vary considerably in colour, and the relative length of the joints of the antennæ and tarsi appears in some of the species to be rather a misleading character, if too much relied upon:—

- I. Antennæ serrate from the third joint; second joint small; size larger.
 - i. Thorax broadly emarginate at apex, with posterior angles carinate, and not, or scarcely, divaricate.
 - 1. Upper surface brown; third joint of antennæ fully as long, or longer than fourth *A. RHOMBEUS*, Ol.
 - 2. Upper surface deep shining black; third joint of antennæ slightly shorter than fourth *A. NIGER*, L.
 - ii. Thorax truncate at apex, with posterior angles not carinate, strongly divaricate *A. UNDULATUS*, De G.
- II. Antennæ scarcely serrate, almost filiform; size smaller.
 - i. Anterior coxæ narrowly distant; male more elongate and parallel-sided than the female, and with the thorax more rectangular and longer in proportion to its breadth.
 - 1. Upper surface duller; punctuation of thorax closer and thicker; third joint of antennæ about three times as long as second; third joint of tarsi almost concealed; size smaller *A. LONGICOLLIS*, Ol.
 - 2. Upper surface more shiny; punctuation of thorax less close; third joint of antennæ about



- twice as long as second; third joint of tarsi small but distinct; size larger *A. DIFFORMIS*, *Lac.*
- ii. Anterior coxæ rather widely distant; sexual differences not striking.
1. Tarsi with the second and third joints lobed, the fourth simple almost concealed.
- A. Colour as a rule darker and more unicolorous; punctuation of thorax stronger; third joint of antennæ plainly longer than second *A. HÆMORRHOIDALIS*, *F.*
- B. Colour as a rule lighter, margins and posterior angles of thorax often reddish-yellow; punctuation of thorax less strong; third joint of antennæ very little longer than second *A. VITTATUS*, *F.*
2. Tarsi with the second to the fourth joints decreasing gradually in length, scarcely visibly lobed; antennæ with the third joint not much longer than second *A. SUBFUSCUS*, *Müll.*

***A. rhombeus*, Ol.** A large and conspicuous species, of a dark brown, ferruginous, or reddish-yellow colour, with the head and thorax sometimes darker, clothed with rather long greyish pubescence; head rather strongly punctured, forehead deeply impressed, antennæ as long as head and thorax, ferruginous or rufous, serrate, last joint with contracted and conical apex; thorax rather flat, longer than broad, with sides subparallel, narrowed in front, posterior angles projecting, carinate, upper surface strongly punctured, sparingly on disc, thickly at sides; scutellum large and long, rather convex; elytra slightly broader than thorax, long, subparallel, very gradually narrowed to apex, with the pubescence in fresh specimens thicker behind middle, and more or less abraded, the smooth space presenting the appearance of an obscure V; the striæ are rather deep, and the interstices slightly convex and not closely but distinctly punctured; legs reddish-testaceous. L. 16–18 mm.

In decaying trees and logs; also by sweeping bracken; rare; Lea Wood (Stephens); Lyndhurst and Brockenhurst, New Forest; Sherwood Forest; Dunham Park (Chappell); the only specimen I ever captured was taken about the last day of July 1877 in the New Forest on bracken.

***A. niger*, L.** Deep black, shining, more strongly convex in the female than in the male, subparallel, clothed with greyish pubescence which is long and thick on the elytra; head distinctly and rather strongly punctured, forehead depressed, antennæ rather long, black, serrate, third joint much longer than second; thorax sinuate before posterior angles, which are carinate, finely punctured, more closely at sides than on disc, with traces of a central furrow often present; elytra rather broader than thorax, with sides very slightly rounded, and gently and gradually narrowed from posterior third to apex which is broad, striæ fine and shallow, interstices more or less raised in middle, finely punctured; legs black, apex of tarsi often more or less reddish. L. 9–14 mm.

Male with the antennæ longer and the thorax oblong; in the female the antennæ are shorter and the thorax quadrate.

By beating and sweeping; in woods, &c.; as a rule not very abundant, but rather common and generally distributed throughout the kingdom as far north as the Moray district of Scotland.

A. undulatus, De G. (*trifasciatus*, Herbst.; v. *bifasciatus*, Gyll.). The most conspicuous of our species, and one of the rarest of our indigenous Coleoptera; elongate, subparallel, elytra somewhat depressed on disc, head and thorax dull black, elytra brown with very distinct waved bands of greyish pubescence; the colour, however, is somewhat variable, the basal part of the elytra being sometimes considerably lighter than the apical portion, and more or less rufous; head thickly punctured, forehead scarcely impressed, antennæ black, moderately long, serrate, with the second joint very small, and the apex of last joint contracted and conical; thorax longer than broad, rather convex, narrowed in front, and strongly sinuate before posterior angles which are much produced and divaricate, upper surface very thickly and rugosely punctured, with traces of a smooth central line in centre or channelled; elytra with distinct punctured striæ, interstices finely punctured; legs black, with claws reddish. L. 12–15 mm.

Male with the antennæ considerably longer than in female; according to Thomson the elytra of the male have the base and a waved central band clothed with thick greyish pubescence, whereas in the female they are entirely pubescent, with two wavy denuded bands, one before and the other a little behind middle; in a female specimen, however, which I have before me, there are three plain denuded bands on the elytra.

Very rare; taken in small numbers by Turner at Rannoch, Tay district, Scotland; it appears to be a highland or mountain species.

A. longicollis, Ol. (♀ *crassicollis*, Lac.). Elongate, dull, clothed with greyish pubescence; head and thorax very thickly punctured, black, with the sides and posterior angles of the latter often more or less yellowish-brown; elytra yellowish-brown, with suture and side margins more or less distinctly darker, sometimes unicolorous, with punctured striæ, interstices finely and more or less rugosely punctured; under-side dark, with abdomen lighter, but variable; legs testaceous, with femora often infusate; the thorax in both sexes is more or less distinctly channelled; this is often used as a character to distinguish it from several allied species, but is not dependable, as the central thoracic channel is often traceable in certain specimens belonging to species that are usually regarded as not possessing it. L. 8–9 mm.

Male very different from female, with the body longer, more narrow and parallel and more depressed, the thorax narrow and rectangular, the antennæ very long, and the elytra more parallel-sided, with the striæ and punctuation of interstices slightly stronger.

Female broader, less parallel and more convex, with the thorax broader and rounded and narrowed in front, and the antennæ much shorter; the elytra are considerably broader in proportion, and are slightly widened before apex; this sex much resembles at first sight a light example of *A. vittatus*, but may at once be known by the sculpture of the thorax, which is much coarser and duller, and the very short second joint of the antennæ.

By sweeping herbage; local; rather common and generally distributed from the Midland districts southwards, but much rarer further north; the male is usually common where it occurs, but the female is always very scarce; Northumberland district, one female only taken at Gibside by Mr. J. K. Taylor; Scotland, very rare, Forth district, "Dalmeny Park, near Edinburgh," Murray's Cat.

A. difformis, Lac. (♀ *carus*, Germ.). Larger, more darkly coloured, and more shining than the preceding species, with which it is rather closely connected as far as structure is concerned; the second joint of the antennæ, also, is longer in proportion, and the thorax is less thickly punctured, with the central furrow less evident; colour lighter or darker reddish-brown, with the head and thorax often darker, the sides and posterior angles being usually lighter than the disc, pubescence fine, greyish; head rather coarsely punctured; thorax thickly but not rugosely punctured; elytra with fine striæ, interstices finely punctured and more or less rugose transversely, especially in the male. L. 9-10 mm.

Male with the head deeply impressed, the antennæ a little longer than in female, and the thorax narrower, rectangular and parallel-sided; the elytra are narrower and more parallel, with the striæ finer and the interstices more rugose transversely.

Female with the head not depressed, the antennæ a little shorter, with the first joint longer, and the thorax more finely punctured, with the sides less parallel, somewhat rounded and narrowed in front, and the anterior angles much less pronounced; the striæ of the elytra are rather stronger, but the interstices are more finely and less rugosely punctured; this sex much resembles *A. vittatus*, but may be known by having the thorax more finely punctured, and the sides straight and not sinuate before the posterior angles.

Grassy places by sweeping, &c., especially at night; for a long time it was considered one of our rarest British beetles, but has recently been taken in numbers by Mr. Butler and others in the south of England; the female, however, appears to be always very much scarcer; Easry, Kent (Gorham); Ramsgate, in alders (Stephens); Shepherd's Well and Sandwich (Waterhouse); St. Peter's, Kent (T. Wood); Deal (C. G. Hall); Hastings district, in numbers (Butler, Collett, &c.); one specimen is said to have occurred at Newton, Devon.

A. hæmorrhoidalis, F. (*ruficaudis*, Steph.). Elongate, sub-parallel, clothed with rather thick greyish pubescence, pitchy brown or brown, with the head and thorax black, sometimes brown, but usually darker than elytra, which are sometimes lighter brown; head thickly

and strongly punctured, antennæ a little longer than head and thorax, pitchy, with the second joint much shorter than third, last joint more or less contracted at apex; thorax longer than broad, with sides almost parallel, slightly narrowed in front, posterior angles short not carinate, upper surface thickly and rather strongly but not rugosely punctured; elytra slightly broader at base than thorax, with rather strong punctured striæ, interstices finely, but plainly, punctured; under-side of abdomen reddish-brown; legs somewhat variable in colour, lighter or darker reddish-brown. L. 9–13 mm.

On bracken, young hazels, birches, &c.; also by general sweeping; very common and generally distributed throughout the kingdom.

A. vittatus, F. Very closely allied to the preceding, of which it has by some authors been regarded as a variety; light examples are very easily known by their colour, which is lighter or darker reddish-brown, with the vertex of head, disc of thorax, and suture and sides of elytra dark; from this, however, the colour ranges to that of ordinary dark specimens of *A. hæmorrhoidalis*; these can only be distinguished from the latter species by having the thorax more finely punctured, with the sides straighter before the posterior angles, and by the fact that the second joint of the antennæ is longer and, as a rule, very little shorter than the third joint; in nearly all the specimens I have seen, the species may be distinguished by the rather bright reddish posterior angles of thorax. L. $8\frac{1}{2}$ –12 mm.

On young hazels, oaks, birches, &c.; much less abundant than the preceding species, but generally distributed throughout the greater part of England and Scotland, and probably Ireland; Bold records it as not abundant in the Northumberland and Durham district, but according to Sharp it is common in Scotland, so he may have overlooked its occurrence or confused it with the preceding species.

A. subfuscus, Müll. Smaller than either of the two preceding species, elongate, rather shining, head and thorax more or less dark, front of former and sides margins and posterior angles of latter often more or less broadly brownish-yellow, elytra brownish-yellow or brownish-testaceous; head strongly and thickly punctured; antennæ rather long and slender in both sexes, but more so in the male than the female, yellowish-brown with lighter base, with the third joint not much longer than second; thorax longer than broad, with the sides more feebly rounded in male than in female, subparallel, posterior angles short, upper surface very finely punctured, the punctuation being sparing on disc and closer at sides, pubescence rather long; elytra broader at base than thorax, with fine striæ, interstices finely but plainly punctured, pubescence short; legs yellowish-brown or testaceous, tarsi with the second to the fourth joints decreasing gradually in length, scarcely visibly lobed. The species may be easily recognized by its small size and the fine punctuation of the thorax, as well as by the structure of the antennæ and tarsi. L. 7–8 mm.

By sweeping, &c.; very rare; Orkney and Shetland Islands; Mr. Chappell has recorded it from Llangollen. The *A. subfuscus* of Stephens which he records from the New Forest is only *A. vittatus*.

LIMONIUS, Eschscholtz.

This genus is distinguished from *Athous* by having the first tarsal joint not or only slightly shorter than second, and from *Corymbites*, to certain species of which some of its members bear a rather strong superficial resemblance, by the absence of ventral epipleuræ, the eyes sunk further in the thorax, and the short and scarcely projecting posterior angles of the thorax; about sixty species are contained in the genus, which are chiefly confined to Europe, Northern Asia, and North America; two or three species have been described from the Australian region; about a dozen occur in Europe, of which three have been reputed as British, but one of these is very doubtfully indigenous, and requires further confirmation.

- I. Length 8-10 mm.; upper surface distinctly metallic; thorax coarsely and thickly punctured, with central furrow distinct **L. CYLINDRICUS**, Payk.
 II. Length 5-6 mm.; upper surface not or scarcely metallic; thorax finely and diffusely punctured, with central furrow obsolete **L. MINUTUS**, L.

L. cylindricus, Payk. (*æruginosus*, Ol.). Oblong, subcylindrical, elytra somewhat depressed on disc, of a dark and more or less obscure æneous colour, clothed with distinct greyish pubescence; head strongly punctured, antennæ moderately long, obtusely serrate; thorax convex, longer than broad, with sides slightly rounded and narrowed in front, rather strongly and thickly punctured, central furrow distinct, posterior angles very slightly projecting; scutellum large, closely punctured; elytra parallel-sided, very slightly dilated behind middle, with fine punctured striæ, interstices rather finely and thickly punctured and feebly rugose; legs black or pitchy. L. 8-10 mm.

Male with the antennæ longer, and the last joint elongate; female with the antennæ shorter and the last joint oblong.

In damp grassy places; by sweeping; local and not common; Birch Wood, Esher, Woking, Haslemere, Chertsey, Horsell, Sandhurst; Norfolk; Suffolk; Devon; Swansea; Burnham, Somerset; Hartlebury, Worcestershire; York; Manchester; Northumberland and Durham district; Scotland, local, Solway, Tweed, Forth, and Moray districts; Ireland, near Dublin, local.

L. minutus, L. (*♂ forticornis*, Bach). Much smaller and narrower than the preceding, black, shining, with or without a slight æneous reflection, clothed with fine and sparing greyish pubescence; head strongly punctured, with blackish pubescence, antennæ varying in the sexes, black, second and third joints small, about equal; thorax much longer than broad, sparingly and rather finely punctured, with sides sub-

parallel, slightly rounded and narrowed in front, posterior angles blunt, scarcely projecting; scutellum large; elytra much depressed at base, with sides straight and very gradually narrowed to apex, with distinct punctured striæ, interstices closely punctured and somewhat rugose; legs black or lighter or darker pitchy brown, claws somewhat dilated until middle, and then suddenly narrowed, forming a tooth. L. 5-6 mm.

Male with the antennæ longer, rather sharply serrate, last joint elongate and obliquely truncate at apex; female with the antennæ shorter and obtusely serrate, last joint oblong.

On flowers, &c.; local; London district, not uncommon and generally distributed; not common apparently in the south of England; Glanvilles Wootton; Devon; Bristol; Swansea; Midland districts, generally distributed; Ipswich; Cambridge; Chat Moss; Northumberland and Durham district, widely spread but not common; Scotland, rare, Tweed and Forth districts.

(*L. parvulus*, Panz. Larger than the preceding species, slightly narrowed in front and behind, black with a greenish-brassy tinge, and much more pubescent, the hairs being yellowish or golden coloured, the antennæ slighter, the tarsi and tibiæ testaceous, and the claws not dentate, except at extreme base. L. 6-7 mm.

"One specimen taken by Mr. Sidebotham near Devizes" (Crotch, Proc. Ent. Soc., 19th Nov., 1866.).

SERICOSOMUS, Redtenbacher. (*Sericus*, Eschscholtz.)

This genus contains about fifteen species, which are confined to Europe, Northern Asia, Japan, and North America; it is distinguished from *Athous* by having the first tarsal joint shorter, and from *Limonius* by the longer and somewhat spiniform posterior angles of thorax; the tarsal claws are simple, and the antennæ are rather short and serrate from the fourth joint; three species are found in Europe.

S. brunneus, L. (*fugax*, F.). Oblong, clothed with fine silky pubescence, dull, colour variable; head thickly punctured, antennæ rather short, serrate from the fourth joint inclusive, second joint small; thorax rather longer than broad, convex, with thick and shallow umbilical punctures, central furrow more or less distinct, posterior angles strongly projecting and carinate, embracing the shoulders; scutellum large, thickly punctured; elytra rather strongly acuminate towards apex, finely striated, interstices thickly granulate; legs more or less fuscous or reddish-testaceous. L. $6\frac{1}{2}$ -9 mm.

Male narrower, with thorax more parallel-sided, black, with a more or less distinct greenish reflection; elytra dark brown or reddish-brown, with or without suture darker; under-side dark.

Female broader, with thorax less parallel-sided, light ferruginous or reddish-brown with a longitudinal patch in centre, and often two others

at sides dark; the breast and base of abdomen is also blackish; sometimes the whole upper surface is ferruginous or reddish-brown.

Sandy places; under stones, &c.; occasionally by sweeping; local and, as a rule, not common; Chobham, Surrey; Esher; New Forest (where it is more common); Cannock Chase; Burnt Wood, Staffordshire; Cheshire; Scotland, local, Solway, Tay, Dee, and Moray districts.

The *Elater fugax* of Fabricius is evidently the male of this insect, and his *E. brunneus* the female, as he distinctly describes the latter as "thorace rufo, medio nigro, elytris corporeque ferrugineis" (Syst. El. ii. 237); Thomson, however (Skand. Col. vi. 97), mentions the *E. fugax* of Gyllenhal as the female; Gyllenhal's description, however, of *E. fugax* (Ins. Suec. i. 428) appears to refer to the variety of the male with castaneous elytra; he mentions the insect as being found on umbelliferous plants, particularly *Heracleum*.

SYNAPTUS, Eschscholtz. (*Ctenonychus*, Stephens.)

This genus is distinguished by having the third joint furnished with a very large membranous lobe beneath; the prosternal sutures are dilated in front and excavate, and the tarsal claws are pectinate; it is closely allied to *Adrastus*, under which it is included by Thomson and other authors; there is only one species belonging to the genus which is found in Europe, Armenia, and Siberia; it occurs very rarely in Britain.

S. filiformis, F. (*Adrastus filiformis*, Thoms.; *Ctenonychus hirsutus*, Steph.). A rather large, elongate, and subcylindrical species, black, or pitchy brown, clothed with long and thick recumbent greyish pubescence, which gives the insect a leaden grey appearance; head thickly punctured, antennæ rather long, pitchy or reddish, with the second joint slightly shorter than third; thorax longer than broad, distinctly punctured, more thickly at sides, with an obsolete central furrow, posterior angles projecting and divaricate, sides rounded and contracted in front, sinuate before posterior angles; scutellum large, thickly pubescent; elytra long, gradually narrowed to apex, with rather fine punctured striæ, interstices thickly and finely punctured; legs pitchy or reddish, with tarsi usually lighter. L. 9–10 mm.

By sweeping grass at the sides of water, &c.; rare; Bristol (Stephens); Tintern, Monmouthshire; Gloucester, banks of Newent Canal; South Wales. Mr. Allen Harker records it as "rather common by sweeping long grass under hedges by canal banks in Gloucestershire. June."

ADRASTUS, Eschscholtz.

This genus contains nine species, all of which occur in Europe, except one from New Caledonia; our common species *A. limbatus* bears a strong superficial resemblance to *Agriotes pallidulus*, but may easily be

known by its shorter and more globose thorax, and the fact that the second joint of the antennæ is not longer than the third joint; a second species has lately been added to our lists by Mr. E. A. Waterhouse.

- I. Antennæ entirely clear reddish-yellow; size larger; colour lighter *A. LIMBATUS*, F.
 II. Antennæ fuscous or brownish with base light; size smaller; colour darker *A. PUSILLUS*, F.

***A. limbatus*, F.** A small elongate and narrow species with the head and thorax deep black, shining, and the elytra brownish-testaceous with the suture and sometimes the sides dark; pubescence greyish, rather coarse, and not thick; head rather strongly punctured, antennæ rather long, longer in male than in female, reddish-yellow, or brownish-yellow with lighter base, serrate from third joint inclusive; third joint longer than second; thorax as long as broad, convex, finely punctured, with sides almost parallel, slightly rounded in front, posterior angles projecting; elytra gradually narrowed to apex with rather strongly punctured striæ, interstices finely punctured; legs reddish yellow, femora often darker. L. 4–4½ mm.

Grassy places in woods; by sweeping; rather local, but not uncommon and generally distributed in the London, Southern, and Midland districts; rarer further north; Northumberland and Durham district, not common; Scotland, rare, Solway district; Ireland, Armagh and Dublin, and probably widely distributed.

***A. pusillus*, F.** Much smaller and darker than the preceding, and with the elytra more strongly acuminate; the antennæ are fuscous or brownish with the base clear reddish-testaceous; the pubescence also appears to be thicker; the size and colour will at once distinguish it; some specimens are entirely pitchy black with the shoulders alone pale; the species has been mixed with the preceding in some collections as a small and dark variety. L. 2½–3 mm.

Taken by Mr. E. A. Waterhouse in July by sweeping long coarse grass in open ground three or four miles from Sandwich, and also recorded by Mr. C. G. Hall from Deal and Dover; the species is apparently common all over Europe.

AGRIOTES, Eschscholtz.

This genus contains upwards of a hundred species, of which about forty occur in Europe; of the remainder a considerable proportion are found in Central America, but very few occur south of that country, and they range as far north as Siberia; they are distinguished by having the claws simple, and the sides of thorax obtuse, the margin being deflexed in front; the second joint of the antennæ is usually longer than the third.

The larvæ of several of the species of this genus are exceedingly destructive to garden and farm crops, and, together with one or two other larvæ, belonging to other allied genera, constitute the well-known “wire-worms” which are so much dreaded by all who have to do with the cultivation of the soil; they have been described and figured by many authors, and a long account of them, with beautiful

plates, will be found in Curtis' Farm Insects, pp. 152-209, Plates F and G; the eggs are nearly globose or slightly oval, yellowish-white, and very minute, and are laid in the earth close to the root of a plant, or between the sheaths near the base of the stalk; from these the larvæ hatch, and appear to continue in the larval state for from three to five years, feeding at the roots of corn and other plants, which they bore through and through, and soon destroy; they obtain their name of wire-worms from their long narrow form and extreme toughness, the whole body above and below being covered with corneous scuta; in general appearance they much resemble the "meal-worms," the larvæ of *Tenebrio*, but in structure are very different; they are fulvous or more or less castaneous in colour, cylindrical and parallel-sided, with all the segments about equal in breadth, except the last, which is pointed at apex; the antennæ and legs are very short; when the larva has arrived at maturity, it descends to a considerable depth in the earth, and there forms a cell composed of the surrounding particles of soil; here it changes to a pupa of a yellowish-white colour, which is rather narrow and elongate, without "styli motorii," and terminated by two short cerci.

In a work like the present it is of course impossible to discuss the preventive remedies that have been adopted against this pest, which is more dreaded by the farmers and gardeners than any other insect; it may, however, be mentioned that clean farming is above all things necessary, and that the removal of all patches of weeds which might harbour the insect, and paring and burning the surface of the ground have often been found very advantageous; nitrate of soda, soot, guano, lime-water, and the refuse of gas-works are destructive to them, and rolling with a heavy roller in March and April, when the beetles begin to emerge, is sometimes very serviceable, as also is the treading of the barley in early spring by sheep, &c.; when the wire-worms attack a garden, large numbers may be taken by burying sliced potatoes near the infested plants; these attract them, and they may be captured in large quantities. One of the greatest agencies, however, in keeping down the plague is found in the birds, especially rooks, which destroy them in countless numbers, and should by every means be encouraged; when we see rooks busy in a field, apparently pulling up blades of corn, it will usually be found on further examination that they are only destroying infected blades in search of the wire-worms; pheasants and partridges are very fond of them, and have often been found of great use in destroying them. There are two crops mentioned by Curtis which these insects seem particularly to dislike, and these are white mustard and woad, and it is said that these crops will completely free a field from them. It may perhaps be observed, in conclusion, that great as is the damage done by the wire-worm, a great deal of injury is assigned to it of which it is quite innocent, as Centipedes, Millipedes (*Julus* and *Polydesmus*), and the larvæ of the Daddy Long-legs (*Tipula oleracea*) and many other insects, all fall under the denomination of "wire-worms" in the eyes of the ordinary agriculturist.

Of the six British species mentioned in the following list, the first three are those that do most damage; the fourth is very rare in Britain, and the last two are much narrower and smaller insects, and not much appears to be known concerning their earlier stages.

- I. Form broader; thorax with posterior angles not or only obscurely lighter than the rest of the upper surface.
- i. Posterior coxæ slightly dilated internally; punctuation of interstices of elytra feebler.
 1. Elytra unicolorous.
 - A. Size smaller; thorax longer; antennæ shorter and more slender A. SPUTATOR, L.
 - B. Size larger; thorax shorter; antennæ longer and stouter A. OBSCURUS, L.
 2. Elytra with the interstices alternately lighter and darker A. LINEATUS, L.
 - ii. Posterior coxæ rather strongly dilated internally; upper surface unicolorous, almost black; punctuation of interstices of elytra stronger A. SORDIDUS, Ill.
- II. Form narrow and slender; thorax with posterior angles yellowish-red; elytra light brown with suture blackish, sometimes unicolorous.
- i. Size larger; punctuation of thorax finer and more diffuse; posterior angles of thorax ridged A. SOBRINUS, Kies.
 - ii. Size smaller; punctuation of thorax coarser and closer; posterior angles of thorax not ridged A. PALLIDULUS, Ill.

A. sputator, L. (*rufulus*, Lac.; *graminicola*, Redt.). Oblong, convex, fuscous black or dark brown, sometimes castaneous, rather thickly clothed with greyish pubescence; head thickly punctured, antennæ entirely yellow or brownish-yellow, second joint considerably longer than third, and longer than fourth; thorax longer than broad, convex, thickly and distinctly punctured, posterior angles considerably produced, rather sharp, plainly keeled; scutellum large, situated in a deep basal depression of elytra; elytra with sides very slightly rounded, and very gradually contracted towards apex, broadest in middle, deeply but finely striated, interstices flat, finely punctured and transversely rugose; legs brownish-yellow with femora often darker. L. 5-6 mm.

Under stones; at roots of grass; in moss, flood refuse, &c.; common and generally distributed throughout the south of England and the Midland districts; not so common further north; Scotland, rare, Solway and Tweed districts.

A. obscurus, L. (*variabilis*, F.). Larger, more convex and less parallel-sided than the preceding, with the thorax shorter and duller and more thickly and strongly punctured; colour fuscous, or brown, unicolorous, or with the thorax dark and the elytra lighter or darker brown; antennæ longer and stouter than in *A. sputator*; thorax very strongly and thickly punctured, subtransverse, posterior angles sharp, moderately or indistinctly keeled; elytra with sides rounded, dilated about middle, and rather strongly narrowed at apex, with fine punctured striæ, and broad and flat finely punctured and transversely rugose interstices; under-side dark brown or black; legs brownish-yellow or reddish with femora darker. L. 8-9 mm.

Under stones; in moss, &c.; generally distributed and common throughout the kingdom.

A. lineatus, L. (*segetis*, Bjerk.). Allied to the preceding, but easily distinguished by its colour, the thorax being fuscous, and the elytra having the interstices alternately yellowish-brown and dark brown, giving the insect a lined appearance; head thickly punctured, antennæ reddish-yellow; thorax about as long as broad, closely and distinctly punctured, but not so closely as in *A. obscurus*, with the posterior angles sharp and keeled; elytra broadest in middle, with punctured striæ which appear as if arranged in pairs, interstices finely punctured; legs brownish with femora darker. L. 8 mm.

Under stones; at roots of grass, &c.; common and generally distributed throughout the greater part of England, but more local further north; Scotland, local, Solway and Forth districts; Ireland, near Belfast and Dublin, and probably common.

A. sordidus, Ill. (*rufipalpis*, Brull.). This species, in general appearance, much resembles a very large dark example of *A. sputator*; apart, however, from its larger size, it may be known by the stronger punctuation and more evidently transverse striation of the interstices of the elytra, and by the darker colour of the legs and of the antennæ, of which the first joint is more or less fuscous, and the third joint is longer proportionally; from *A. obscurus* it may be known by its longer thorax and more parallel shape, and from *A. lineatus* by its colour, and from both by the stronger sculpture of the elytra; the posterior coxæ, moreover, are more strongly dilated internally. L. 8–9½ mm.

Sandy coasts and banks of rivers; under stones; also rarely in flood refuse; very local and usually rare; Sheerness (taken in abundance during the early summer of 1874 by Mr. Champion and Mr. J. J. Walker); Chatham; Strood; Walton-on-Thames; Sunbury; Lymington; Isle of Wight; Cowes, Isle of Wight, and Seaford, Devon (J. J. Walker); Weymouth; Lancaster (Reston).

A. sobrinus, Kies. (*pallidulus*, Redt., *nec* Ill.; *Adrastus acuminatus*, Steph.). Elongate, rather depressed, with greyish pubescence; head and thorax black, shining, posterior angles of the latter yellowish-red; elytra brownish-yellow, with the suture almost always distinctly dark, and the base and side margins often infusate; head large, with eyes rather prominent, somewhat strongly punctured, antennæ long, reddish-yellow with base often lighter; thorax longer than broad, with rather fine and not close punctuation, posterior angles sharp, keeled; scutellum elongate oval; elytra slightly rounded at sides and gradually narrowed to apex, rather plainly pubescent, with fine punctured striæ, interstices finely but distinctly punctured; legs reddish-yellow. L. 5½–6 mm.

By beating and sweeping; in woods, &c.; rather local; Chatham, Darenth Wood, Mickleham, Coombe Wood, Caterham; Hastings; New Forest; Devon; Bath; Midland districts, generally distributed; York; Northumberland district, not common, Prudhoe, Gosforth, and banks of the Irthing; not recorded from Scotland.

A. pallidulus, Ill. (*umbrinus*, Germ.) Very closely allied to the preceding, but considerably smaller, with the elytra not so long pro-

portionately, less evidently pubescent, and having the interstices narrower and not so closely punctured; the thorax also is more closely and distinctly punctured; the species most closely resembles *Adrastus limbatus* in size and general appearance, but may at once be known by its longer and less globose thorax, and by having the second joint of the antennæ longer than the third, whereas in *Adrastus* it is slightly shorter than third. L. $3\frac{1}{2}$ –4 mm.

By sweeping herbage, beating young oaks, birches, hazels, &c.; generally distributed and common throughout the greater part of the kingdom; in fact it is to be found on almost all young trees in woods in early spring.

(*A. pilosus*, Panz. There is a specimen of this fine species in Dr. Power's collection; it is elongate, fuscous or reddish-brown, rather dull, clothed with rather thick greyish pubescence; antennæ moderately long, feebly serrate, with the second and third joints almost equal; thorax convex, longer than broad, thickly and strongly punctured, posterior angles strongly projecting and sharply carinate; elytra long, with punctured striæ; interstices thickly punctured and somewhat rugose. L. 12–14 mm.

This species is a native of Germany, and feeds at the roots of plants in mountainous districts. Dr. Power's specimen is an undoubted importation, having been found by Mr. Sidebotham in a collecting bottle given by him to a Manchester working man, who probably took it in a yard where timber, dye-woods, and roots were stored, as he was in the habit of visiting such a place.)

DOLOPIUS, Eschscholtz.

This genus has been by many authors included under *Agriotes*, from which it chiefly differs in having the second joint of the antennæ equal in length to the third, and the sides of thorax acute with the margin straight in front; only one species occurs in Europe, which is very common throughout the greater part of the kingdom.

D. marginatus, L. (*depressus*, Esch.). Elongate, rather depressed, colour variable, the thorax being sometimes black with margins and posterior angles reddish-testaceous, sometimes reddish-testaceous with disc only darker, and sometimes entirely reddish-testaceous; the elytra are either unicolorous testaceous, or, as is generally the rule, testaceous with the suture broadly blackish, the sides also being sometimes darker; head thickly punctured, antennæ rather long, testaceous, sometimes more or less infusate; thorax longer than broad, subparallel, distinctly punctured, with posterior angles projecting; elytra with punctured striæ, interstices finely and closely punctured, scarcely rugose; under-side dark; legs testaceous. L. 5–6 $\frac{1}{2}$ mm.

By beating and sweeping in woods, &c.; generally distributed throughout the whole kingdom, and, as a rule, common; abundant in many localities.

CORYMBITES, Latreille.

This genus contains about two hundred species, which are chiefly confined, as is the case with several of our other genera of the Elateridæ, to Europe, Northern Asia, and North America; several, however, have been described from the Cape of Good Hope and Natal, and a few from Ceylon, Australia, and New Zealand, so that it is probable that the genus will prove to be a very extensive one; the genus is allied to *Campylus*, but differs in having the eyes only moderately prominent, and the margin of the front not reflexed; the intermediate coxæ are not approximate, and the prosternal sutures are occasionally, but very rarely, excavate in front; in some species the antennæ in the male are strongly pectinate or even flabellate, and some are conspicuous by reason of their strong metallic colouring, in which they differ from the great majority of the Elateridæ.

The larva of *C. æneus* is described and figured by Schiödte (Part v. p. 519, pl. viii. fig. 8); it is pale ferruginous with the mandibles and frontal margin pitchy, and the scuta marked with very fine longitudinal ferruginous lines; the thoracic segment is slightly narrowed in front, but the whole insect is linear and parallel, and does not call for any particular comment; the larva of *C. castaneus* is also figured by Schiödte on the same plate (fig. 10); in general shape it resembles that of *C. æneus*, but the abdominal segments have a large dark patch on each side, and the ninth segment is more square, with the upper surface more deeply sculptured, and more divergent cerci.

There are forty-five species found in Europe, of which ten occur in Britain; these may be distinguished as follows:—

- I. Antennæ serrate from the third joint inclusive, often pectinate in the male.
 - i. Thorax villose, with posterior angles not carinate; antennæ deeply pectinate in the male and serrate in the female *C. CASTANEUS*, L.
 - ii. Thorax more or less distinctly pubescent, but not villose, with posterior angles carinate.
 1. Antennæ strongly pectinate in male and serrate in female; thorax strongly channelled longitudinally.
 - A. Processes of the joints of the antennæ in male twice as long as the joints; punctuation of thorax less close; colour, as a rule, bronze-green . . . *C. PECTINICORNIS*, L.
 - B. Processes of the joints of the antennæ in male not much longer than the joints; punctuation of thorax very close; elytra with basal portion more or less broadly yellow, or upper surface entirely coppery reddish or violet, very seldom greenish . . . *C. CUPREUS*, F.
(*v. æruginosus*, Germ.)
 2. Antennæ obtusely serrate; thorax very obsoletely channelled.
 - A. Form larger and less parallel-sided; punctuation of thorax coarse and strong *C. TESSELLATUS*, F.
 - B. Form smaller and more parallel-sided; punctuation of thorax very close and fine *C. QUERCUS*, Gyll.

II. Antennæ obtusely serrate from the fourth joint inclusive.

i. Thorax with the posterior angles carinate; size larger.

1. Antennæ with the third joint one and a half times as long as second; pubescence thick and silky and arranged in patches, giving the upper surface a strongly variegated appearance; upper surface not metallic

C. HOLOSERICEUS, F.

2. Antennæ with the third joint double as long as second; upper surface more or less distinctly metallic.

A. Upper surface strongly metallic (usually bright æneous or blue), without pubescence

C. ÆNEUS, L.

B. Upper surface not strongly metallic, with distinct pubescence, which is, however, not arranged in patches.

a. Thorax with obsolete central furrow; pubescence fine and close, yellowish; legs red; size smaller

C. METALLICUS, Payk.

b. Thorax with central furrow more or less distinct, at all events at base; pubescence coarse and rather scanty, whitish; legs, as a rule, black; size larger

C. IMPRESSUS, F.

ii. Thorax with the posterior angles not carinate, upper surface very finely punctured; size small; elytra black with a yellowish spot at shoulder or entirely reddish-yellow

C. BIPUSTULATUS, L.

C. castaneus, L. (*Calosirus castaneus*, Thoms.). Head and thorax black, clothed with thick villose yellow pubescence; elytra of a bright yellowish-castaneous colour with the apex black; antennæ, legs, and under-side black; head very thickly and rather coarsely punctured, eyes moderately prominent, thorax varying in the sexes, thickly and finely punctured, longer than broad, with posterior angles prominent and divaricate, not carinate; scutellum large, dark; elytra long oval, with sides gently rounded, with fine punctured striæ, interstices finely punctured and pubescent; under-side clothed with fine and sparing greyish pubescence. L. 8-9 mm.

Male narrower than female, with the thorax narrower and more parallel-sided, and the antennæ longer and strongly pectinate.

Female broader and more convex, with the thorax more ample and more rounded at sides, and the antennæ shorter and strongly serrate.

By sweeping, &c.; very rare; Moushold Heath, Norwich, and Isle of Wight (Stephens); Monmouth, under stones (Kuper); Northumberland and Durham district, Sea-coast near Hawthorne Dene, Rev. R. Kirwood (Bold).

C. pectinicornis, L. (*Ctenicerus pectinicornis*, Latr.). A large and conspicuous species, of an æneous-green colour, shining; head very strongly punctured, antennæ black; thorax longer than broad, coarsely and strongly punctured, but less closely than in the succeeding species, central furrow broad and distinct, posterior angles much projecting,

sharp and strongly carinate; scutellum large, closely punctured; elytra with rather fine punctured striæ which are deep at base, interstices finely punctured and transversely rugose; legs black, with claws, and often knees, red. L. 12–16 mm.

Male narrower than female, with thorax longer in proportion and more parallel-sided in front; antennæ longer, strongly pectinate, the processes of the joints being twice as long as the joints themselves.

Female broader, with thorax more convex and rounded in front; antennæ shorter, strongly serrate.

By sweeping long grass, &c.; local; not, apparently, found in the London district or the south of England; Bewdley Forest; Knowle and Coleshill, near Birmingham; Malvern Hills; North Wales; banks of Bollin, Cheshire; Staffordshire; Langworth Wood, Lincoln; Yorkshire; Bowdon, Manchester; Northumberland, Cumberland, and Durham district; Scotland, rare, Tweed, Forth, and Arygle districts.

C. cupreus, F. (*Otenicerus cupreus*, Latr.). Rather smaller on an average than the preceding, to which it bears a strong superficial resemblance as far as structure is concerned; thorax coppery, greenish, or reddish, elytra with apical half or third dark, more or less distinctly metallic, usually greenish or coppery, basal portion yellowish-testaceous, the testaceous colour extending to middle or considerably beyond middle, shoulders with a metallic patch on each; head coarsely punctured, antennæ black; thorax much as in the preceding species, but more closely punctured and duller; elytra with rather fine punctured striæ which are deep at base, interstices finely punctured and transversely rugose; legs black, claws, and often knees, red; the colour of the upper surface is very variable. L. 12–14 mm.

The sexual differences are much as in the preceding, except that the processes of the joints in the pectinate antennæ of the male are considerably shorter, being not much longer than the joints.

By sweeping, &c.; local; often found in company with the preceding, and like it not occurring apparently in the London district or the south of England; there is only one record, from Exeter, which may perhaps be a true one, as it occurs in the west; Norwich; Dean Forest; Cheltenham; Birmingham district; Llangollen; North Wales, Snowdon, Llanberis, Llyfnant Valley near Glandovey, &c.; Cannock Chase; Church Stretton, Cheshire; Repton; Needwood, Staffordshire; Langworth Wood, Lincoln; Harrogate; Ripon; Teesdale; Isle of Man; Lancashire; Northumberland and Durham district; Scotland, common, Solway, Forth, Clyde, Tay, Dee, and Moray districts; Ireland, Dublin, Newcastle co. Down, Armagh, Antrim, &c., and probably generally distributed.

V. æruginosus, F. This variety has the upper surface unicolorous, of a bright reddish-coppery or violet-coppery colour, shot with green if held against the light.

Occurs with the type, and is not uncommon.

In this species the female appears as a rule to be much rarer than the male, but Stephens records an instance of the capture of a large

number of specimens in North Wales in 1829, among which scarcely a single male was observed.

C. tessellatus, F., nec L. (*Actenicerus sjælandicus*, Müll.). Of a somewhat obscure æneous colour, with violet, coppery or bronze reflection, clothed with fine and rather close greyish pubescence, which is often arranged on the elytra in more or less distinct tessellate patches; head closely punctured, antennæ black or pitchy, obtusely serrate; thorax a little longer than broad, with sides rounded and narrowed in front, thickly and rather strongly punctured, more closely at sides where the punctuation is more or less rugose, often with a small impression on each side before middle, central furrow obsolete, posterior angles projecting, carinate, and somewhat divaricate; scutellum large; elytra with fine and scarcely punctured striæ, which are deep at base, interstices very finely punctured; legs pitchy. L. 12–14 mm.

Male with the antennæ longer and the last joint elongate, female with the antennæ shorter and the last joint oval.

Marshy places; in moss and by sweeping; local; London district, not common, Esher, Wimbledon, Battersea Fields, Woking, Epping Forest; New Forest; Glanvilles Wootton (abundant); Woodbastwick; Wicken and Burwell Fens; Suffolk; Horning Fen; Swansea; Carrington Moss; Hale Moss; Chat Moss; Bewdley; Knowle; Repton; Bowdon, Manchester; Northumberland and Durham district, not common; Scotland, local, Tweed, Solway, Clyde, Argyle, Tay, Dee, and Moray districts; Ireland, near Dublin.

C. quercus, Gyll. (*incanus*, Gyll.; *Liotrichus quercus*, Kies.). The smallest of our species with the exception of *C. bipustulatus*; elongate, narrow and parallel-sided, clothed with very fine greyish pubescence; colour leaden black; head and front margin of thorax thickly and rather strongly punctured, antennæ moderate, feebly serrate from the third joint inclusive; thorax, except anterior margin, very closely and finely punctured, much longer than broad, with very obsolete central furrow, which is often scarcely traceable, posterior angles prominent and carinate; elytra parallel, with rather distinct striæ, interstices finely and closely punctured, often more or less rugose; legs lighter or darker pitchy or testaceous; under-side black with whitish pubescence. L. 7–8 mm.

Male with the antennæ longer than in female, and the last joint a little more elongate.

Grassy places; by sweeping; also by beating low trees; not common in the London district or the south; Birch and Darenth Woods, Chobham, Dulwich, Belvedere; New Forest; common and generally distributed from the Midlands northwards; Scotland, common, Solway, Tay, and Dee districts; Ireland, Armagh, Dublin, Belfast, Newcastle co. Down, Donegal, &c.

V. ochropterus, Steph. This variety has the elytra entirely of a yellowish-testaceous colour; it is found with the type, but not so commonly.

C. holosericeus, F. (*tessellatus*, L., *nec* F.; *Tactotomus holosericeus*, Kies.). Rather broad and depressed, dark brown, thorax and elytra clothed with patches of thick silky yellowish pubescence, which give the upper surface a strongly variegated appearance; head and thorax very thickly punctured, the latter about as long as broad, with sides rounded and narrowed in front, posterior angles carinate, blunt and scarcely prominent; antennæ short, obtusely serrate from the fourth joint; elytra with sides rounded, broadest behind middle, finely striated, interstices very finely punctured; legs pitchy red or ferruginous; under-side black or dark pitchy brown. L. 8–9 mm.

Male with the thorax a little longer and narrower than in female.

Grassy places, by sweeping, &c.; occasionally under stones, on wet decaying oak apples, &c.; rather local, but widely distributed throughout England and Wales; less common further north; Scotland, rare, Forth district.

C. æneus, L. (*Diacanthus æneus*, Latr.; *Selatosomus*, Steph.). One of our most conspicuous species; broad and convex, but with the elytra somewhat depressed on disc, glabrous and very shining; colour varying through a great number of shades, but most commonly æneous or bright blue; sometimes the head is blue and the elytra æneous; occasionally violet, greenish, or even bronze-black varieties occur; the colour of the legs also varies from black to clear red; head small, triangular, coarsely punctured and impressed; antennæ rather short, black, obtusely serrate from the fourth joint; thorax broad and ample, with sides rounded and narrowed in front, central furrow visible behind, posterior angles projecting, strongly keeled, upper surface distinctly but not very closely punctured on disc, more closely at sides; elytra somewhat dilated behind middle, where they are broadest, with fine punctured striæ, interstices broad, very finely punctured; the size also is rather variable. L. 10–14 mm.

Male with the thorax a little longer and less dilated than in female.

Under stones, especially in mountainous and hilly districts, in early spring; local; Belvedere; Birch Wood; Fakenham; common in Devon on high ground, Dartmoor, Drewsteignton, Blackdown, &c.; Llangollen, Barmouth, Penmaenmawr, and other Welsh districts; Malvern Hills (common at the end of April and beginning of May); Birmingham district; Cannock Chase; Sherwood; Church Stretton and Withington, Cheshire; Dunham Park, Manchester; not recorded by Bold from the Northumberland and Durham district; Scotland, local, Forth, Tay, and Dee districts.

C. metallicus, Payk. (*nigricornis*, Panz.; *Diacanthus metallicus*, Latr.). Elongate, moderately convex, elytra rather depressed on disc, of an obscure æneous colour, often with a very slight greenish reflection, upper surface clothed with distinct but short yellowish, almost golden pubescence, which is not arranged in patches but evenly distributed; head strongly punctured, antennæ pitchy, rather slender, feebly serrate from the fourth joint inclusive; thorax convex, about as long as broad, with posterior angles projecting and carinate, distinctly and not very thickly punctured on disc, more thickly at sides; elytra about as broad

as thorax, scarcely widened behind middle, finely striated, interstices very finely punctured and transversely rugose; under-side black with metallic reflection; legs red. L. $8\frac{1}{2}$ –10 mm.

Male with the antennæ and thorax a little longer, and the latter a little less dilated at sides.

By sweeping bracken, &c.; occasionally by beating sallows, &c., in woods; rare; Darenth Wood, Ripley, Weybridge, Wimbledon, Loughton; New Forest; Somerset; Swansea.

C. impressus, F. (*Diacanthus impressus*, Latr.). A large and rather broad species, elytra depressed on disc, black with a very slight bronze reflection, clothed with rather sparing and somewhat uneven whitish pubescence; head thickly and coarsely punctured, impressed, antennæ about as long as head and thorax, obtusely serrate from the fourth joint; thorax slightly longer than broad in male, quadrate and slightly dilated at sides in female, not thickly punctured on disc, but with the punctuation thick and rugose at sides; the central furrow is distinct, at all events at base, and behind the middle on each side of it there are two distinct round foveæ; the posterior angles are projecting and carinate; scutellum large, closely punctured; elytra broad, somewhat broadest behind middle, with fine punctured striae, interstices distinctly punctured and transversely rugose; legs black, occasionally pitchy, rarely ferruginous. L. 11–13 mm.

On the Scotch fir, and on birch; in mountainous districts; local; Northumberland district, on the birch near Gilsland, rare (Bold); Scotland, Highlands, Tay, Dee, and Moray districts (Braemar, Aviemore, &c.); Ireland, Churchill, co. Armagh, one specimen on birch.

C. bipustulatus, L. (*Diacanthus bipustulatus*, Latr.). The smallest of our species; black, shining, very sparingly pubescent, each elytron with a distinct reddish-yellow spot at base, elytra sometimes entirely reddish-testaceous; head coarsely punctured, antennæ ferruginous, rather short, feebly serrate from the fourth joint; thorax about as long as broad, rather strongly convex, with sides rounded and contracted in front, posterior angles projecting and divaricate but rather short and not carinate; upper surface finely and not closely punctured; scutellum large, orbicular; elytra with sides rounded and somewhat dilated behind middle, where they are broadest, with distinct punctured striae, interstices sparingly punctured; legs pitchy brown or reddish with femora darker. L. 6–7 mm.

In decaying willow, &c.; also by sweeping; rare; Esher and Claygate; Wrabness, Essex; Tonbridge; Abbots Wood; Sandwich; Hastings; New Forest; Glanvilles Wootton; Killerton Park, Exeter; Norfolk; Bagley Wood, Oxon; Sherwood Forest (Turner).

The pale variety of this species may be at once known from the *v. ochropterus* of *C. quercus* by its shorter, less parallel-sided, and less closely punctured thorax, and the more rounded sides of elytra, as well as by the shorter antennæ, and the fact that the posterior angles of the thorax are not carinate.

CAMPYLUS, Fischer. (*Denticollis*, Piller; *Lepturoides*, Herbst.)

This genus is easily distinguished from all our other Elateridæ by having the eyes very prominent and entirely free, not touching the angles of the thorax, and the forehead with the anterior margin sharply raised and reflexed; the intermediate coxæ are somewhat approximate; the antennæ are very long; the thorax is truncate at apex, and the posterior angles are not carinate; the genus contains about fifteen species, which are confined to Europe, the Black Sea region, Northern Asia, and North America; our single British species stretches across Europe and Siberia; it is very variable in colour, and superficially resembles certain species of *Telephorus*; the larva is dark brown, slightly reddish; it bears a strong resemblance to the larvæ of certain species of *Athous*.

C. linearis, L. (♀ *mesomelas*, L.). Elongate and parallel-sided, colour very variable; male with the head, except front, black, the thorax red, occasionally darker on disc, and the elytra testaceous, with or without dark suture, rarely black, female with the head and thorax as in male, elytra black with borders testaceous, or testaceous with the suture broadly black, or rarely testaceous; head strongly punctured, antennæ long, with the second joint very short; thorax longer than broad, very coarsely punctured, with sides rounded and narrowed in front, posterior angles sharp, very projecting and divaricate; there is a deep longitudinal channel on disc, and two strong transverse impressions before base nearly meeting the central channel; elytra with coarsely punctured striæ, interstices punctured and transversely rugose; under-side black, apex of abdomen testaceous; legs lighter or darker testaceous, more or less pitchy, with the femora usually dark, sometimes almost entirely pitchy. L. 9–12 mm.

Male with the thorax narrower and less rounded in front, and the elytra narrower and more parallel-sided; female with the thorax broader and more rounded in front, and the elytra more ample, somewhat dilated behind middle.

By beating and sweeping in woods, &c.; has also been bred from birch stumps; somewhat local, but not uncommon and generally distributed throughout the greater part of England and Scotland, and probably Ireland. Dr. Sharp records it as local in Scotland in the Solway, Tweed, Tay, Dee, and Moray districts; the female appears to be much scarcer than the male, as far as my own experience goes.

DASCILLIDÆ.

This family connects the section *Malacodermata* or *Malacodermi* of various authors with the Cebrioidæ and Rhipiceridæ, neither of which families are represented in Britain; the genus *Cebrio* is rather closely connected with *Campylus*, with which it agrees in having the prosternum produced into a process behind; in fact it is by some authors included under the Elateridæ; on the other hand it bears in many respects a strong affinity to *Dascillus*, and also to *Rhipicera* and *Callirhipis*, which

are chiefly distinguished from the latter genus by having the antennæ strongly branched and the tarsi differently clothed beneath ; as at present constituted the Dascillidæ contain about thirty or forty genera and upwards of three hundred species ; the genus *Dascillus* might perhaps be made the type of a distinct family apart from the Cyphonidæ, but it is perhaps better to follow the usual arrangement and regard them as tribes. The following are the chief characteristics of the family :—
 Antennæ distant, inserted immediately in front of the eyes, 11-jointed, filiform or slightly serrate ; mentum corneous ; ligula large, membranous, often divided into lobes or laciniaë ; labrum distinct ; anterior coxæ distant at base, conical, anterior coxal cavities open behind ; mesosternum small ; metasternum moderate ; posterior coxæ transverse, nearly contiguous, immoveable, and receiving the femora ; legs short or moderate ; tibiae slender, tarsi evidently 5-jointed, shorter than the tibiae, frequently with membranous lobes beneath ; claws simple or pectinate.

- I. Mandibles prominent ; antennæ with the third joint longer than the fourth ; anterior coxæ with distinct trochantin DASCILLINA.
 II. Mandibles not prominent ; antennæ with the third joint shorter than the fourth ; anterior coxæ without trochantin CYPHONINA.

DASCILLINA.

This tribe contains some fifteen or sixteen genera, which are very widely distributed from Kamtschatka to the Straits of Magellan ; two only, *Dascillus* and *Pseudodactylus*, are found in Europe, represented by four species ; of these one genus and one species are found in Britain.

DASCILLUS, Latreille. (*Atopa*, Paykull.)

About a dozen species are comprised in this genus, which are found in widely separated regions of the world, representatives occurring in Europe, North America, Java, India, China, and the southern part of South America ; they are distinguished by the peculiar formation of the maxillæ and labium ; the outer lobe of the former is divided into two elongate laciniaë, which extend considerably beyond the inner lobe, and the labium is also laciniate, the laciniaë, as is the case with the maxillæ, being membranous and hairy and considerably projecting ; in fact the trophi of this genus are among the most remarkable of any of the Coleoptera ; three species occur in Europe, of which one is found in Britain ; it is a comparatively large, robust, and convex insect, of oblong-oval form, with the second to the fourth tarsal joints furnished with membranous plates beneath ; the larva is described by Erichson (Archiv. de Wieg., 1841, i. p. 88) ; it is very short and contracted, and clothed with regular rows of scanty bristly hairs ; it bears a strong analogy to the larvæ of the Lamellicorns, but its head is much larger and the body is not curved ; the antennæ are 4-jointed, and there are no ocelli ; the legs are rather long ; the abdominal segments are very short with the exception of the last, which is as long as the two preceding together,

and is rounded in a semicircle and terminated by two points ; this larva appears to live underground at the roots of plants, especially Orchidaceæ.

D. cervinus, L. (*cinereus*, F.). Elongate oblong-oval, convex, completely clothed with very thick and fine greyish pubescence, and very thickly and finely punctured ; head moderately large, depressed between eyes, antennæ long, filiform, with the first and second joints short, and the third joint very long ; thorax broader than long, narrowed in front, with sides slightly rounded, base feebly sinuate, posterior angles almost right angles ; scutellum semicircular or slightly cordiform ; elytra broader than thorax, subparallel, rounded at apex, with irregular rows of larger punctures and traces of raised lines ; legs rather long and stout, tarsi broad, tibiæ with distinct spurs. L. 8–10 mm.

Male smaller and narrower, with the thorax less convex and the elytra more acuminate at apex, and the legs shorter, with stronger tibial spurs ; the last ventral segment also is subacuminate ; this sex may easily be known by its colour, which is unicolorous black or dark pitchy brown, with the apex of abdomen lighter ; the female is broader than the male, and usually has the head and thorax brown, and the under-side black brown, and the elytra, apex of abdomen, antennæ, and legs more or less obscurely testaceous ; rarely the female is coloured as the male.

On flowers, especially *Umbelliferae*, also on alders, brambles, &c. ; local, and in some chalky districts not uncommon ; London district, Chatham, Box Hill, Leith, Hill, Croydon, Mickleham, Caterham ; Dover ; Brighton, on thistles ; Devonshire, Drewsteignton, Dartmoor, Barnstaple ; Dean Forest ; Swansea ; Llangollen ; Barmouth ; Llanberis ; Matlock ; Scarborough ; Northumberland and Durham district ; Scotland, local, in old pasture lands, Solway, Clyde, Tay, Dee, and Moray districts ; Ireland, near Belfast, and Carlingford Mountain on heather (Johnson).

CYPHONINA.

This tribe contains about twenty genera, which are found in almost all parts of the world ; they are, as a rule, very fragile and soft-bodied insects, and have very little in common with the *Dascillina* as far as outward appearance is concerned ; with the exception of *Eucinetus* all the European genera are represented in Britain ; they may be divided as follows :—

I. Prosternum indistinct before and between the coxæ ; penultimate joint of tarsi bilobed ; elytra without engraved lines.

i. Posterior legs not formed for leaping ; tibial spurs small or obsolete.

1. Mandibles curved and acuminate ; punctuation distinct, more or less coarse.

A. Antennæ filiform in both sexes.

a. Antennæ with the third joint very small, transverse

HELODES, Latr.

b. Antennæ with the third joint larger, not transverse.

- a*. Antennæ long, with the third joint as broad as second, and the remaining joints elongate, cylindrical MICROCARA, *Thoms.*
- b*. Antennæ comparatively short, with the third joint narrower than second, and the remaining joints shorter, obconical CYPHON, *Payk.*
- B. Antennæ serrate in male, subfiliform in female PRIONOCYPHON, *Redt.*
2. Mandibles short and broad, and blunt at apex; punctuation very fine and indistinct HYDROCYPHON, *Redt.*
- ii. Posterior legs formed for leaping, the femora being strongly thickened; tibial spurs long SCIRTES, *Ill.*
- II. Prosternum distinct before and between the coxæ; penultimate joint of tarsi not lobed; elytra with deep engraved lines EUBRIA, *Germ.*

HELODES, Latreille.

Fourteen species belonging to this genus are found in Europe, of which two occur in Britain; they may be easily known by the very small transverse third joint of the antennæ, which are long and slender; the eyes are very large, the thorax almost semicircular, and the intermediate coxæ contiguous.

The larva of *Cyphon pallidus* (*Helodes minuta*) is described and figured by Chapuis et Candèze (Cat. des Larves des Coléoptères, p. 153, pl. v. fig. 5); it is 5-6 mm. in length, of a greyish-black colour, rather short and broad, somewhat onisciform; the head is much narrower than the prothorax, which is about as long as the meso- and metathorax together; the anal segment is considerably narrower than the preceding; the antennæ are very long, being almost as long as a third of the body, and the legs are short and, unless stretched out, not visible from above; the sides of the body are thickly fringed with fine short cilia; these larvæ live on aquatic plants, and in the early part of June change into pupæ, from which the perfect insect emerges in about fifteen days.

- I. Head and thorax reddish-testaceous H. MINUTA, *L.*
- II. Head and thorax black, the latter with margins more or less broadly testaceous H. MARGINATA, *F.*

H. minuta, *L. (pallida, F.)*. Oblong-ovate, moderately convex, clothed with pale pubescence, testaceous, with the eyes, suture, and apex of elytra, and the abdomen, black; the colour is somewhat variable, the elytra being sometimes unicolorous with the apex narrowly black, and sometimes dark with the shoulders only lighter; head small, eyes large; antennæ long, stouter in male than in female, dark with the base light; thorax finely punctured, almost semicircular; scutellum large, distinctly punctured; elytra broader than thorax, elongate oval, thickly and plainly punctured, with distinct traces of raised lines; legs reddish-testaceous, posterior femora plainly punctured. L. $3\frac{1}{2}$ - $4\frac{1}{2}$ mm.

Male with the antennæ stouter than in female, and furnished with erect pale pubescence; last ventral segment of abdomen emarginate at apex, and with a deep semicircular impression, the sides of which are fringed with greyish hairs.

By beating sallow, alder, &c.; also by sweeping herbage; usually, but not always,

in marshy or damp places; common and generally distributed throughout the kingdom.

H. marginata, F. (*trilineata*, Chevr.). Oval, clothed with silky pubescence; allied to the preceding, but easily recognized by its colour, the head being black or pitchy brown, and the thorax black with the margins more or less broadly yellow; antennæ black with base yellow, first or first and second joints black, or spotted with black; elytra varying from black or pitchy black to a greyish-yellow testaceous colour with suture, apex, and sides dark, thickly punctured, with traces of raised lines; legs dark, with knees, and sometimes tarsi and tibiæ, obscurely yellowish. L. $3\frac{1}{2}$ –4 mm.

Male with the antennæ clothed with short and thick whitish pubescence, abdomen with the last segment slightly emarginate at apex.

By sweeping in moist places; rather local in England; Hastings; Southampton; Glanvilles Wootton; Devon; Bath; Swansea; Midland districts, generally distributed, Birmingham district, Burton, Dove Dale, &c.; Hale, Cheshire; Northumberland and Durham district; Scotland, common on herbage near burns, Solway, Forth, Clyde, Tay, Dee, and Moray districts; Ireland, Armagh, common.

Besides the difference in colour, this species may be distinguished from the preceding by its shorter form, more closely punctured elytra, the more acute posterior angles of the thorax, and the shorter posterior tarsi.

MICROCARA, Thomson.

The species belonging to this genus have been by most authors included under *Helodes*; they may, however, be distinguished by having the third joint of the antennæ larger and not transverse, the thorax shorter, the eyes smaller and less prominent, and the intermediate coxæ separated by a small interval; we possess as British two out of the three European species, but one of these, *M. Bohemanni*, appears to be merely a variety of *M. livida*.

M. livida, F. (*testacea*, L.). Oblong-oval, subconvex, somewhat depressed on disc, rather dull, clothed with pale pubescence of a livid or brownish-testaceous colour; head small, eyes black, prominent, antennæ fuscous with base lighter; thorax very transverse, more than double as broad as long, thickly and finely punctured, posterior angles very blunt, hind margin strongly sinuate; scutellum large, finely punctured; elytra rather broad, subparallel, sometimes a little darker at suture and towards apex, thickly and distinctly punctured, with traces of raised lines; legs reddish-testaceous. L. $3\frac{1}{2}$ – $4\frac{1}{2}$ mm.

Male with the fourth and fifth segments of the abdomen furnished with a setigerous pore.

By sweeping herbage in damp places, also by beating hedges; common and generally distributed throughout the greater part of the kingdom.

V. Bohemanni, Mannh. This variety, which by Thomson and other authors is considered a separate species, differs from the type form in being smaller and rather more shining, and in having the disc of the thorax more or less broadly nigro-fuscous; the lateral margins of the thorax are also more elevated. L. $3\frac{1}{2}$ mm.

Much less common than the type; it has occurred near Birmingham and Dumfries, and in other localities.

CYPHON, Paykull.

This genus contains about fifty or sixty species of small and insignificant insects, which in many instances closely resemble each other and are difficult to determine; from the allied genera *Helodes* and *Microcara* they may be known by their shorter antennæ and generally smaller size; twenty-five species inhabit Europe, of which six occur in Britain; of the remainder a considerable proportion have been found in North America; several have been described from Chili, and representatives have been recorded from Senegal, Ceylon, Cuba, Patagonia, and Tasmania, so that the genus is evidently a widely distributed and extensive one; the species, however, are so exceedingly fragile and perishable that it is very hard to preserve them in anything like good condition, and they are therefore much neglected by collectors.

- I. Elytra with three feeble raised longitudinal lines on each.
 - i. Elytra more closely and finely punctured; upper surface less shining C. COARCTATUS, Payk.
 - ii. Elytra less closely and more strongly punctured; upper surface more shining C. NITIDULUS, Thoms.
- II. Elytra without raised lines.
 - i. Average length $2-2\frac{1}{2}$ mm.
 - 1. Punctuation fine and comparatively close C. VARIABILIS, Thunb.
 - 2. Punctuation coarse and not close C. PUNCTIPENNIS, Sharp.
 - ii. Average length $1\frac{1}{3}-1\frac{1}{2}$ mm.
 - 1. Fourth joint of antennæ one and a half times as long as third; elytra without distinct dark markings C. PALLIDULUS, Boh.
 - 2. Fourth joint of antennæ twice as long as third; elytra with suture, sides, and base more or less dark C. PADI, L.

C. coarctatus, Payk. (♀ *fuscicornis*, Thoms.; *griseus*, Gyll.; *palustris*, Thoms.). Oval, moderately convex, but depressed on disc, clothed with rather long greyish pubescence, of a lighter or darker reddish-brown colour, which is variable; head rather large, eyes prominent, black; antennæ yellowish, fuscous towards apex; thorax very short, narrower than elytra, posterior angles almost right angles, base sinuate; scutellum large, punctured; elytra thickly and distinctly punctured, with three raised lines on each, shoulders strongly marked; legs testaceous. L. $2-2\frac{1}{2}$ mm.

Marshy places, by beating and sweeping herbage, &c.; usually recorded as common and generally distributed throughout the greater part of the kingdom; Mr. Champion, however, mentions it as rare in the London district (Sheerness and Leith Hill), and it is probable that the succeeding species is often confounded with it. Dr. Sharp records both species as common in Scotland. Ireland, Dublin, &c.

C. nitidulus, Thoms. (♀ *pallidiventris*, Thoms.). Very like the preceding, but, as a rule, larger, with the upper surface more shining, and the pubescence more scanty, and the elytra more sparingly but more strongly punctured; the thorax also is somewhat more narrowed in front; the upper surface is also said to be less convex and the colour darker, but these differences do not appear to be very reliable. L. 2–3 mm.

Found under the same circumstances as the preceding, and apparently as widely distributed; it appears to be the commonest species in the London district, but less common in the Midlands; Scotland, common, Solway, Forth, Clyde, Tay, Dee, and Moray districts; it is probably common in Ireland.

The *C. fuscicornis* and *C. pallidiventris* of C. G. Thomson are respectively the females of *C. coarctatus* and *C. nitidulus*; they are distinguished from the male by having the elytra more thickly and finely punctured in the neighbourhood of the scutellum.

C. variabilis, Thunb. (*pubescens*, F.; ♂ *nigriceps*, Kies.). In size and general appearance this species much resembles the two preceding, but may be easily known by its longer and more oval form, and the absence of raised lines on the elytra, which are, moreover, less depressed on disc and more finely punctured, and have the shoulders much less marked; the prevailing colour is reddish-testaceous above, and fuscous beneath, but is very variable, the suture and sides of elytra being often more or less obscurely darker; the head, as a rule, is dark, at all events on vertex, and the antennæ are dark with light base or light with dark apex; the pubescence is rather long and thick. L. 2–2½ mm.

Marshy places, by sweeping grass, &c.; also at the roots of grass, and in moss and flood refuse; common and generally distributed throughout the kingdom.

The *C. nigriceps* of Kiesenwetter appears to be the male of this insect, which differs in being rather smaller and shorter, with the elytra more sparingly punctured; the *C. nigriceps* of Dr. Sharp's catalogue (1st edition), however, is a different insect, and was afterwards named by him *C. punctipennis*.

C. punctipennis, Sharp (*nigriceps*, Brit. Cat., nec Thoms. et Kies.). Allied to *C. variabilis*, but shorter, broader, and more convex, and distinguished from all the varieties of this species by its extremely short, fine, and scanty pubescence; the elytra, as a whole, are evidently more sparingly punctured, although around the scutellum they are more closely punctured; in *C. variabilis* the punctuation is even; the elytra, also, are shorter and broader in proportion than in this latter species, and have the shoulders more strongly marked; the colour, as a rule,

appears to be rather bright reddish-testaceous, with the head dark, and the antennæ dark with the base lighter; the legs are testaceous. L. $2-2\frac{1}{4}$ mm.

A northern species; rare; Scotland, Solway, Tay, and Dee districts; it is very probable that the specimens referred to by Bold (Catalogue of the Insects of Northumberland and Durham, page 75) as *C. nigriceps* belong to this species.

C. pallidulus, Boh. (*ochraceus*, Steph.). A small, oval, shining, entirely testaceous species, with the eyes black, and the antennæ towards apex and the elytra at sides sometimes slightly darker; the form is shorter, more convex, and rather broader in proportion than in *C. variabilis*, the elytra are rather more strongly and less thickly punctured, and the pubescence is more scanty; from *C. punctipennis* it may be known by its smaller and more oval form and more closely and less strongly punctured elytra. L. $1\frac{1}{2}$ mm.

Marshy places, by sweeping grass, &c.; local; London district, rather common, Lee, Chatham, Esher, Wimbledon, Reigate, Leith Hill, Sheerness, Rusper, Tonbridge; Wicken Fen; New Forest; Devon (recorded as very rare on mountain ash at Haldon); Knowle; Cannock Chase; Bewdley; Repton; Northumberland district, rare, Long Benton, Gosforth, &c.; Scotland, local, Solway, Tay, Dee, and probably other districts.

C. padi, L. (*discolor*, Panz.; *pygmæus*, Payk.). The smallest of our species, which may at once be known by its size and colour; oval, moderately convex, somewhat depressed on disc, clothed with rather thick and strong greyish pubescence; head and thorax dark, antennæ rather short, dark with base lighter; elytra varying from entirely dark with apex lighter to testaceous with suture and sides dark; legs testaceous, with femora usually darker; the elytra are very closely, but rather strongly punctured, the punctuation, as in fact is the case in all the species, becoming finer and more or less obsolete at apex. L. $1\frac{1}{3}-1\frac{1}{2}$ mm.

Marshy places, by sweeping grass, &c.; also in moss and flood refuse; somewhat local, but generally distributed throughout the kingdom; Bold records it as not common in the Northumberland and Durham district, but Dr. Sharp mentions it as being common in Scotland; it appears to be very local, however, in the Midlands, as far as my experience goes.

PRIONOCYPHON, Redtenbacher.

This genus contains one European and two North American species: the former is found very rarely in Britain, and may be known from all our other Cyphonidæ by having the antennæ in male serrate from the fourth joint; the third joint is very small, scarcely visible, and the first is much dilated; the posterior tarsi have the first joint elongate, scarcely shorter than the remaining joints together.

P. serricornis, Müll. (*chrysomeloides*, Steph.). Of an almost

round oval shape, entirely rufo-testaceous, clothed with silky yellowish pubescence, rather strongly convex; head large, eyes moderately prominent, black; thorax short, with posterior margin strongly rounded, and much produced behind, scarcely visibly punctured; scutellum large, very finely punctured; elytra strongly and moderately thickly punctured, without traces of raised lines; legs testaceous, tarsi short. L. 3-4 mm.

In the female the antennæ are almost filiform.

By sweeping herbage in damp places in woods; also occasionally in decaying logs; it has also been found in nests of *Formica rufa*; very rare; Darenth Wood, Mickleham, Caterham, Coombe Wood, Ashted, Birch Wood (Champion, Power, and others); Littlington, Sussex (Power); Glanvilles Wootton (taken by Mr. Dale in the garden hedge Aug. 7, 1841); Bath (one specimen taken by Mr. Gillo in a hollow tree on Claverton Down); Bretby Park, near Burton-on-Trent (J. T. Harris); Sherwood Forest (Matthews).

HYDROCYPHON, Redtenbacher.

This genus contains three species, one from Ceylon and two from Europe; one of the latter is found rather commonly in the North of England and in Scotland; it much resembles a dark *Cyphon*, but may be known by its short broad mandibles, and the fact that the two first joints of the antennæ are thickened and of about equal size, and the third minute, evidently shorter than second, whereas in *Cyphon* the first joint only is thickened, and the third longer than the second; the species may also be known externally by the extremely fine punctuation of the elytra.

H. deflexicollis, Müll. (*Elodes pini*, Curt.). Of an oval form, broader in front and more or less narrowed towards apex, colour fuscous brown or pitchy black, upper surface clothed with rather long light pubescence; head and thorax very finely punctured, antennæ rather stout, slightly narrower towards apex, dark, with base light; thorax very short, with sides rather strongly narrowed in front, base sinuate; scutellum large; elytra broadest before middle, extremely closely and finely punctured, a point that will at once distinguish it from all our species of *Cyphon*; legs yellow. L. $1\frac{1}{2}$ mm.

On shrubs and herbage near brooks and rivers; local and rare in England and Wales; St. Leonards; Glanvilles Wootton; Dunsford Bridge, Devon, on willows; Bewdley Forest; Llangollen; Barmouth; Capel Curig; Ripon; Northumberland and Durham district, rare; Scotland, occurs commonly in the Solway, Tweed, Dee, Moray, and probably the intervening districts.

SCIRTES, Illiger.

The species belonging to this genus are distinguished by having the hind femora strongly thickened, so that they have the power of leaping strongly developed, and are often mistaken at first sight for species of Halticidæ; they are about forty in number and are widely distributed, representatives occurring in North and South America, Cuba, Ceylon, India, Senegal, &c.; two species only are found in Europe, both of which occur in Britain.

- I. Punctuation coarser; colour black *S. HEMISPHERICUS*, *L.*
 II. Punctuation finer; colour testaceous *S. ORBICULARIS*, *Panz.*

S. hemisphæricus, *L.* Broad oval, suborbicular, somewhat narrowed in front and behind, black, or pitchy black, shining, rather convex but depressed on disc, clothed with thin and scanty greyish pubescence; head moderately large, antennæ dark, with base yellow, second joint as broad as first and not much shorter; thorax very short, narrowed in front, very finely punctured, with sides often yellowish, base sinuate; elytra rather strongly and closely punctured; legs more or less obscurely testaceous, with femora darker; tibiæ with very long spurs. *L.* $2\frac{1}{2}$ – $3\frac{1}{2}$ mm.

Male with the last ventral segment of abdomen slightly emarginate at apex, female with the same segment rounded at apex.

In marshy places, by beating sallow, alder, &c.; local; London district, not uncommon, Barnes, Weybridge, Woking, Aylsham, Tonbridge, &c.; Windsor; Wroxham (Norfolk); Pegwell Bay, Deal; Hastings; New Forest; Gleanvilles Wootton; Devon; Swansea; Knowle; Sutton Park; Lichfield; Droitwich; Bromsgrove; Repton; Scarborough; Withington and other localities in Cheshire; Bowdon, near Manchester; not recorded from the Northumberland and Durham district; Scotland, very rare, Solway district only; Ireland, near Dublin.

S. orbicularis, *Panz.* (*pallescent*, *Steph.*). Closely allied to the preceding species, of which it has been by some authors considered a variety; apart, however, from its colour, which is pale fuscous or fusco-testaceous, it may be known by the closer and finer punctuation of the elytra, and rather thicker pubescence; the interstices between the punctures of the elytra, moreover, are slightly rugose. *L.* $2\frac{1}{2}$ – $3\frac{1}{2}$ mm.

Marshy places, by beating tallows, sweeping herbage, &c.; rare; Wimbledon, Esher, and Merton (Power); Battersea Fields (Stephens); Dagenham, Essex; Sheerness (Walker); Gravesend; Deal; Sandown; Spitchwick Park, Devon (Stephens).

EUBRIA, Germar.

The genus *Eubria*, which by some authors has been regarded as forming a separate tribe Eubriina, or even family Eubriadæ, is easily distinguished by having the antennæ serrate from the third joint inclusive, the second joint being minute, and by the strong engraved lines on the elytra; only one species is known, which occurs very rarely in Britain, and is uncommon on the Continent; *E. marchantiæ*, *Duv.*, is now generally regarded as a variety of *E. palustris*.

E. palustris, *Germ.* Orbicular, convex, black or dark pitchy brown, rather shining, extremely closely and finely punctured; head rather small, deeply sunk in thorax, eyes moderately prominent, antennæ rather long, pitchy with base lighter; thorax double as broad as long, narrowed in front, posterior margin very slightly sinuate; scutellum large; elytra broadest behind middle, very finely pubescent, with five deeply engraved lines on each, the first of which reaches from base along scutellum and

thence to about a third of the length of the elytra where it stops, the second is widely interrupted at base and apex, the third and fourth nearly unite at base and quite unite at some distance from apex, and the fifth almost encloses the fourth but ceases before base and apex; legs long and slender, obscurely testaceous with femora usually darker, tarsi elongate and slender. L. $1\frac{1}{2}$ –2 mm.

In moist, damp places by small streams and watercourses; very rare; first discovered in Britain by the Rev. H. Matthews near Weston on the Green, Oxfordshire, who, in company with his brother the Rev. A. Matthews, took a number of specimens on small sticks submerged in a narrow rhein or watercourse; Glanvilles Wootton (Dale and Wollaston); Scarborough (R. Lawson); Northumberland district "upon *Samolus valerandi* in a ravine a little to the north of Castle Eden Dene" (Rev. W. Little).

LYCIDÆ.

The genera belonging to this family are by many authors regarded as merely a tribe of the Lampyridæ, from which they differ by having the trochanters not applied to the femora, but in a line with them, and by the fact that the intermediate coxæ are not contiguous but rather widely separated; the antennæ are always more or less serrate, often pectinate; the claws are simple and the abdominal segments are simple in both sexes; many of the species have the elytra much dilated, the insects in some cases being almost circular; the colours are often very bright, orange or scarlet, and the sculpture is very peculiar, the elytra being often strongly ribbed, with transverse raised lines forming an areolate network; the eyes are larger in the male than in the female, but never very large; the antennæ are 11-jointed, with the second joint often very short, and the tarsi are 5-jointed; the species are diurnal, and are found on the leaves of plants and on flowers; they are carnivorous in their habits.

The larva of *Dictyoptera sanguinea* (which was formerly reputed as British) is described by Erichson (Wieg. Arch. vii. p. 93); it is flat and linear, narrowed in front and behind, deep black above, and whitish with black spots beneath; the last segment is corneous, reddish in colour, and terminates in two projecting bent horny processes; it occurs under bark of oak.

The greater number of the species which belong to the Lycidæ are found in the tropics; they are poorly represented in Europe by seven genera and about twenty species, of which three only occur in Britain; in general appearance and colour these strongly resemble one another, but are now referred to three separate genera; the synthetic genus *Homalisus* ought perhaps to be removed from the family and regarded, as is done by some authors, as a separate family in itself.

I. Antennæ contiguous at base with forehead not or only slightly prolonged between them; sculpture of interstices of elytra very distinct.

i. Third joint of antennæ plainly longer than second, not transverse; elytra with a double series of areolets in each interstice

EROS, Newm.

- ii. Third joint of antennæ very little longer than second, transverse; elytra with a single series of areolets in each interstice PYROPTERUS, *Muls.*
- II. Antennæ somewhat distant at base, with the forehead strongly produced between them; sculpture of interstices of elytra rather indistinct; third joint of antennæ much longer than second PLATYCIS, *Thoms.*

EROS, Newman.

This genus in its widest sense contains about fifty species, which occur chiefly in North and South America; one, however, has been described from Tasmania, and one from Sitkha; nine occur in Europe, of which five belong to the genus as at present constituted; our single species, *E. Aurora*, has only been found very locally in Scotland; its larva does not call for any particular remark; it is elongate, linear and depressed, of a brown colour, smooth and shining, with short antennæ and legs; the head is moderately large, and the prothorax is longer than any of the succeeding segments; the segments are all slightly narrowed in front, with the exception of the last, which is narrower than the rest and rounded behind; there appear to be no cerci; a more or less obsolete central channel runs down all the segments.

E. Aurora, Herbst. (*coccineus*, Gemm.). Rather long and depressed, widened behind; head, under-side, antennæ, and legs black or fuscous black, thorax red with disc more or less fuscous, elytra scarlet, dull; head small, eyes rather large and prominent, antennæ rather stout with second joint very short, third joint longer, not transverse; thorax small, narrowed in front, with five areolets, clothed with rather thick reddish pubescence; scutellum black or fuscous red, emarginate behind; elytra ample, considerably widened behind, with four strong costæ on each, the interstices being filled with a very distinct double row of square cells or areolets; under-side rather shining, breast with reddish pubescence; legs stout, black or fuscous black, claws reddish. L. 6-9 mm.

Male with the antennæ longer, the thorax subquadrate, narrowed towards apex, and the seventh ventral segment of the abdomen deeply emarginate in a semicircle at apex.

Female with the antennæ shorter, the thorax scarcely narrowed in front, and the seventh ventral segment of abdomen entire.

Under bark of spruce fir; very local; Scotland, Highlands, Tay and Dee districts (Rannoch, &c.); it has, however, been taken in some numbers in these localities by Dr. Sharp, Mr. Champion, Mr. Rye, and others.

PYROPTERUS, Mulsant.

One European species is referred to this genus, and Mr. Waterhouse

has described another from Borneo ; it may be easily known from the preceding by the sculpture of the interstices of the elytra, and the small third joint of the antennæ.

P. affinis, Payk. Smaller and more parallel-sided than *Eros Aurora*, which it strongly resembles in general appearance ; it may, however, be easily known by its black thorax, which, like *E. Aurora*, is furnished with five areolet, and by the shorter transverse third joint of the antennæ, and especially by the fact that the interstices between the costæ of the elytra are furnished with a single and not a double row of cells ; the elytra are dull, but the scarlet colour is very bright. L. 6–7 mm.

Male with the antennæ longer, and the seventh ventral segment of abdomen semicircularly emarginate at apex.

Female with the antennæ shorter, and the seventh ventral segment of abdomen subtruncate at apex.

Extremely local ; Mr. Rye first introduced the species on a single specimen taken at Killarney by a son of Mr. J. Hardy in 1866 ; it was subsequently taken in some numbers by the Rev. A. Matthews and his brother in Sherwood Forest ; it occurred on one of the hottest days of summer, flying over and settling on bracken in one particular spot, in which Mr. Matthews took a large series.

PLATYCIS, Thomson.

This genus contains three European species, and Mr. Gorham has joined to it *P. nasatus* from Japan ; the produced forehead and the indistinct sculpture of the interstices of the elytra, which are obscurely biserially areolate, will at once distinguish it.

P. minutus, F. (*pusilla*, Gmel. ; ♂ *nigrorubra*, De G.). Black, with the elytra scarlet, the colour not being quite as bright as in *Pyropterus affinis*, to which species it is closely related ; it may be at once known by having the forehead strongly produced between the antennæ, which are not contiguous, and have the last joint testaceous yellow or reddish-yellow, and the third joint much longer than second ; the thorax has three areolet in front and two lateral ones behind, opening into a central areolet ; the elytra are thickly clothed with reddish-yellow pubescence, and are furnished with four costæ, which are not so pronounced as in the allied genera, the interstices being filled with an indistinct double row of small areolet ; legs black or fuscous, claws reddish. L. $4\frac{1}{2}$ – $5\frac{1}{2}$ mm.

Male with the antennæ longer, and the seventh ventral segment deeply excised at apex.

Female with the antennæ shorter, and the seventh ventral segment subtruncate at apex.

In old stumps of fir, &c. ; occasionally by sweeping and on the wing ; very local ; Stephens records it as found on oak at Coombe and Birch Woods in August and

September; Mickleham and Caterham (Champion); Tunbridge Wells; Ashford; Sandwich; Norfolk; Arundel; Shepherd's Well (Waterhouse); Woodland, Devon (Leach); Leigh Woods, Bristol (in some numbers, Rye and others); Scarborough (Lawson).

LAMPYRIDÆ.

This is a large and important family, the members of which are characterized by having the trochanters applied obliquely to the femora, and the tarsal claws often bifid; the antennæ are either serrate or broadly flabellate or biflabellate, or simple; the abdominal segments in the male are often incised in various fashions; the anterior and intermediate coxæ are contiguous, and the abdomen is composed of seven ventral segments; the tarsi are 5-jointed, and have the fourth joint emarginate. Most of the species have the power of emitting light from the posterior abdominal segments, but this power is by no means universal; in some genera, as in our common glow-worm, the females have the wings very much shortened, rudimentary, or absent, and much resemble the larvæ in general appearance; the large majority, however, of the species which belong to the family have as ample wings in the female as in the male; in the case of those species in which the females are larviform, the males have the eyes very strongly developed, whereas in the females they are small; in those species, however, in which both the male and female are winged, the eyes present but slight differences in size; this fact of itself is sufficient to prove that the light-giving power of the female is bestowed upon it to attract the male.

The Lampyridæ are, as a rule, inhabitants of the tropics; they are very poorly represented in Europe by six genera and about forty species, of which the best known are the glow-worms (*Lampyris*), and the Mediterranean "fire-flies" (*Luciola*); only two genera and two species are found in Britain.

- I. Male with elytra and wings fully developed; antennæ very short, not reaching base of thorax; prothoracic stigma large and open LAMPYRIS, L.
- II. Male apterous, with elytra much abbreviated; antennæ comparatively long; prothoracic stigma hidden PHOSPHÆNUS, Lap.

LAMPYRIS, Linné.

This genus contains more than fifty species, which are widely distributed, representatives occurring in Ceylon, Java, Chili, South Africa, &c., and reaching as far north as Siberia; the genus *Lampyris* proper, however, does not appear to be found in North America; the males are furnished with ample elytra and wings, and very large eyes; the females are larviform, and entirely destitute of both elytra and wings, and have the luminous power strongly developed; in both sexes the head is covered by a prolongation of the prothorax, which, however, especially in the male, is transparent in front of the eyes; no less than twenty-one

species occur in Europe, of which one is found in Britain; it is perhaps the best known and most generally observed of all our Coleoptera, and has been mentioned in song and story from the earliest ages of our literature. A full account of the life-history of the insect is given by Westwood (Classification, i. p. 250); the eggs are large, and are deposited by the female on moss or grass; the larva much resembles the perfect female in general appearance, being long, narrow, and flat, with short legs; the prothoracic segment is semicircular and narrowed in front, completely covering the head, which is retractile; the last abdominal segment is narrower than the rest; the colour of the larva is black, with a pale spot at the hinder angles of each segment; the mandibles are strong, and suited to a carnivorous diet, and it appears to be the fact that it feeds chiefly on small molluscs, and to be very probable that it is from this source that it derives its phosphorescent power; the pupa much resembles the larva; in the female it is quite apterous, whereas in the male it exhibits the rudiments of the elytra and wings; a very short time is passed by the insect in the pupal state.

L. noctiluca, L. Male with ample elytra and wings, elongate, depressed, parallel-sided, clothed with short grey pubescence, of a greyish-fuscous colour, with the sides of thorax, and sometimes of elytra, lighter; apex of abdomen and breast of a dirty-yellowish colour; head concealed by thorax, antennæ short and stout, fuscous; thorax semicircular, about as broad as long, uneven, finely granulate, with a more or less distinct central furrow; elytra elongate, widened behind middle, dehiscent at apex, rugosely sculptured, with distinct traces of raised lines, which are stronger towards base; legs rather short, fuscous; last dorsal segment of abdomen rounded at sides, sinuate on both sides at apex and obtusely acuminate in the middle. L. 10–12 mm.

Female larviform, without elytra or wings, fuscous brown, with margins of thoracic and of the other dorsal segments, and more or less of the breast and ventral segments, obscurely yellowish; the last three segments are entirely yellowish beneath; the mesothorax is small and rounded behind, but the other segments do not differ much, except the last, which is narrow and rounded behind; the segments from the second to the penultimate are narrowed in front, and have the posterior angles blunt but marked, so that the sides of the body appear serrate; antennæ and legs fuscous or fusco-testaceous; the last ventral segment of the abdomen is triangularly emarginate; the thoracic segments have an obsolete central furrow, and the abdominal segments are furnished with a more or less distinct raised longitudinal keel; the general sculpture is finely rugose. L. 12–16 mm.

On heaths, grassy and mossy banks, &c.; the male often flies to light; somewhat local, but generally distributed over the greater part of England; it appears, however, to be commoner in the southern and south-western counties, and, according to my experience, is very local in some parts of the Midlands, although Mr. Blatch has

met with it in many districts (Knowle, Bewdley, Sherwood, Cannock Chase, &c.); in the extreme northern counties it is apparently not uncommon, but local; Scotland, local, Solway, Tweed, Clyde, Forth, and Tay districts; Ireland, near Castleknock, Dundrum, &c.; probably found in many districts, but not recorded.

In the Catalogue of the Coleoptera of Swansea and neighbourhood, Mr. Dillwyn (p. 34) gives the following note on this insect:—"Not uncommon on dry hedge banks; but the light is not so brilliant as it is in chalky soils, nor have I here observed the small light in the males, which is always sufficiently obvious about Dover."

Mr. Dale (History of Glanvilles Wootton, p. 97) says that in some autumns the males fly into the house in great numbers, and that the female is sometimes met with in winter time amongst rubbish.

PHOSPÆNUS, Laporte.

This genus is distinguished by the very short elytra of the male and the long antennæ, and also by having the prothoracic stigma hidden; the eyes are of moderate size; one species only appears to be known, which is somewhat widely distributed in Europe, but has only been found in Britain at Lewes and Hastings; it was thought possible that a colony might have been imported and then established itself at Lewes, but the record from Hastings makes this less probable.

P. hemipterus, Geoff. Fuscous-black or fuscous, clothed with sparing greyish pubescence; the two last segments of the body (whence the light proceeds) are obscurely whitish, especially beneath; head small with eyes moderately large, usually covered by thorax; antennæ fuscous, long and stout; thorax rather long, rounded in front, uneven, somewhat coarsely punctured; elytra very short, dull, finely sculptured, strongly dehiscent; abdomen somewhat widened behind, penultimate joint emarginate in a semicircle, broader than last joint, posterior angles of segments marked, upper surface rugosely sculptured; legs stout, fuscous, rather short, with short and stout tarsi. L. $5\frac{1}{2}$ –7 mm.

In the female there are no wings or elytra; the antennæ are shorter with narrower joints, and the thorax is shorter and broader; this sex appears always to be extremely rare.

The male has been taken in some numbers at Lewes by Miss Hopley, Mr. Morris, and others, crawling on and about walls; I am not aware whether the female has occurred in the locality; Mr. Butler has also recorded the species very rarely from Hastings; the insect has the power of counterfeiting death if disturbed; the larva much resembles those of the other Lampyridæ; it is about 8 mm. long, narrowed in front and behind, black and somewhat shining, with the greater part of the under-side whitish, especially at sides; it appears to be carnivorous like the larva of *Lampyrus*.

TELEPHORIDÆ.

According to the Munich catalogue this family contains thirty-six genera and rather more than six hundred species, which are very widely distributed both in tropical and temperate countries, although they appear to be more characteristic of the latter than of the former; a very fair proportion of the species occur in Europe, and the family is well represented in Britain; the number of genera and species has recently been much increased by the researches of the Rev. H. S. Gorham and others.

The family is characterized by having the antennæ as a rule filiform and simple, rarely serrate, and the trochanters applied to the femora; the edges of the thorax are often plicate or excised; in the exotic genera this character is in many instances extraordinarily marked; the abdomen is soft and composed of six or seven segments, the segments being often divided or excised; the claws are either simple or bifid, and are often armed with a tooth at base; the legs as a rule are long and slender, with the posterior femora projecting far beyond the edges of the elytra.

The British genera may be divided as follows:—

- I. Elytra completely or almost completely covering abdomen.
 - i. Sides of thorax excised before base in male; antennæ serrate *SILIS, Latr.*
 - ii. Sides of thorax entire; antennæ filiform.
 - 1. Head constricted at base, forming a neck; tibial spurs obsolete; claws split *PODABRUS, Westw.*
 - 2. Head not constricted at base; tibial spurs more or less distinct; claws simple or toothed at base, rarely appearing to be split.
 - A. Both the tarsal claws on all the feet with a thorn-like tooth at base, tooth on the anterior claw larger in the female *ANCISTRONYCHA, Maerkel.*
 - B. Outer tarsal claw on all the feet with a more or less tooth-like enlargement at base *TELEPHORUS, Schaeff.*
 - C. All the claws in both sexes with a tooth which being thin, and as long as the claws themselves, causes the latter to appear split *RHAGONYCHA, Esch.*
- II. Elytra abbreviated; body very soft and fragile.
 - i. Mandibles with a tooth on their inner margin; antennæ inserted at some distance from eyes; head and thorax rugosely punctured *MALTHINUS, Latr.*
 - ii. Mandibles without tooth; antennæ inserted nearer to eyes; head and thorax almost smooth, or finely punctured *MALTHODES, Kies.*

SILIS, Latreille.

This genus contains a considerable number of species, which range from Siberia to Brazil; only twenty-four are enumerated in the Munich

catalogue, but the number both of species and allied genera has been largely increased by Mr. Gorham, who has worked out the specimens collected by Mr. G. C. Champion in Central America; the species are known by the peculiar excision of the sides of the thorax before base in the males; the antennæ in *Silis* are feebly serrate, but in some of the allied genera, such as *Thinalmus*, they are strongly flabellate and almost plumose; there are three European species belonging to the genus, of which one occurs rarely in Britain.

S. ruficollis, F. (*rubricollis*, Charp.). Black, with the mandibles, base of first joint of antennæ, thorax and abdomen red; head finely and rugosely punctured, eyes moderately large, antennæ long and rather stout, feebly serrate; thorax transverse, uneven, with coarse irregular punctures on middle of disc, with sides incised and dentate before base in the male, simple in the female; scutellum rather large, rounded behind; elytra about four times as long as thorax, clothed with greyish pubescence, thickly and rugosely punctured, with traces of raised lines; legs black or fuscous, with more or less of tibiæ usually yellowish. L. 5-6 mm.

By sweeping, &c.; rare, and usually confined to fenny and marshy localities; Epping Forest; Dagenham, Essex; Potter Heigham and Wroxham, Norfolk; Horning Fen; Hoveton; Burwell Fen; Whittlesea Mere; Brandon (Suffolk).

PODABRUS, Westwood.

This genus contains about fifty species, which are confined to Europe, Northern Asia, and North America; they are distinguished from *Telephorus* by having the head very strongly contracted behind eyes, the tibial spurs obsolete, and the tarsal claws bifid; there are six European species, of which one is found in Britain; it is locally abundant on or about oak, fir, and other trees in early summer.

P. alpinus, Payk. (*lateralis*, L.). A large and elongate species, which may easily be known by the long head which is strongly contracted behind the eyes, which are very prominent; colour variable, being lighter or darker testaceous, with the vertex of head and the under-side of the body black, or with the elytra entirely black; the ventral part of the thorax is often more or less dark; head coarsely and rugosely punctured, antennæ long, with second joint longer than third; thorax transverse, subrectangular, with the posterior angles more or less distinctly toothed; elytra broader than thorax, elongate, finely and rugosely punctured, with traces of raised lines; legs testaceous, more or less black in different varieties. L. 10-12 mm.

By beating fir trees, also young oak, hazel, birch, &c.; in woods; locally common; London district; Hastings; New Forest; Dorset; Devon; Dean Forest; Birmingham district; Cannock Chase; Repton, Bretby Wood (in abundance on fir trees); Sherwood Forest; Staffordshire; Llangollen; Northumberland and Durham district; Scotland, local, Solway, Tweed, Clyde, Argyle, Tay, Dee, and Moray districts; Ireland, near Dublin.

ANCISTRONYCHA, Maerkel.

This genus may be known from *Telephorus* by the structure of the tarsal claws, both of which are armed in the male with a small tooth, and in the female with a spiniform tooth at base; it contains seven European species, of which one is found in Britain; it is a large and fine insect with deep blue elytra and red thorax, and occurs rarely in hilly and mountainous districts.

A. abdominalis, F. (*cyaneus*, Curt.; *tricolor*, Steph.). A large and conspicuous species; head black with front reddish-testaceous, vertex finely but distinctly punctured, eyes moderately prominent, antennæ long, black, with the first or first two joints testaceous, at all events beneath, with third joint twice as long as second in the female and about three times as long as second in male; thorax reddish-yellow, with the front part more or less dark; elytra of a bright cyaneous colour, rugosely punctured; abdomen testaceous; legs long, black. L. 10-14 mm.

Male smaller and narrower than female, with the second joint of the antennæ shorter and the thorax longer, and with sides straighter and less rounded.

By beating trees; confined to mountainous and hilly districts, and always rare; Llangollen (Reston); Marple, Cheshire, and Miller's Dale, Derbyshire (Chappell); Midgley Moor, Halifax; Teesdale (Harris and Blatch); Cumberland; Northumberland and Durham district; Scotland, Solway, Tweed, Forth, Tay, and Moray districts.

TELEPHORUS, Schaeffer. (*Cantharis*, L.)

This genus, in its widest sense, contains between three and four hundred species, which are widely distributed over the surface of the world; comparatively few, however, occur in tropical countries*; about one hundred and thirty species are found in Europe; of these sixty-nine belong to *Telephorus* proper, and the remainder must be referred to *Rhagonycha* and *Ancistronycha*; from the latter of these genera the genus *Telephorus* is distinguished by having only the exterior tarsal claw toothed at base, and from the former by not having the tarsal claws apparently bifid.

The *Telephori* are rather large and conspicuous insects, and many of the species are very common during the spring and summer on Umbelliferae and flowering plants and shrubs generally; they fly rather slowly and heavily; their jaws are sharp and powerful, and they are very voracious; Professor Westwood says that the females do not even spare

* Mr. Gorham informs me that species apparently not separable from *Telephorus* proper are found not only in the Palæarctic Zone, but in the tropical and south temperate regions of the whole world; the most brilliant species occur in India and China; there is, however, no doubt that many new genera must be formed.

their own mates; the larvæ also are carnivorous, feeding on earth-worms, larvæ, &c., and occasionally on their own species: the perfect insects are well known to ordinary observers, and go by the common name of Soldiers and Sailors.

The larva of *T. fuscus* is described and figured by Westwood (Classification, i. p. 256, f. 27, 16); it is long and fleshy, depressed, and of a velvety-black colour, with an exposed scaly flat head, furnished with strong toothed jaws, two short antennæ, and a single ocellus behind each of the antennæ; the segments are rounded at the sides, the thoracic segments being the largest; the anal segment is furnished on the under-side with a fleshy tubercle, which serves as a proleg; the legs are moderately long, and terminate in a single claw; the larva passes the winter in the full-grown state, and changes to a pupa in April or May, without forming any cocoon, the perfect insect emerging in two or three weeks; the larva lives in moist earth, at the roots of plants and grass, and may often be found creeping on footpaths; the pupa calls for no particular remark.

Fifteen species belonging to the genus *Telephorus* proper are found in Britain; they are very easy to distinguish when once they are known, but they closely resemble one another in structure, and in some species the colour is rather variable, so that it is almost impossible to tabulate them satisfactorily; the following table may, however, be found of some service, although it must be admitted that the character of the impressed lines on the central joints of the antennæ in the males of several of the species is not a very obvious one unless care is used in the examination of specimens.

- | | |
|---|--|
| I. Thorax more or less distinctly and rather coarsely punctured, at all events in female. | |
| i. Thorax red with a central dark spot touching anterior margin; femora black | T. FUSCUS, L. |
| ii. Thorax red with a central dark spot not touching anterior margin; femora mostly red | T. RUSTICUS, Fall. |
| II. Thorax not, or very finely and obsoletely, punctured. | |
| i. Length 10–12 mm.; thorax unicolorous reddish-testaceous; elytra testaceous or black | T. LIVIDUS, L.
(v. <i>dispar</i> , F.) |
| ii. Length 6–10 mm. | |
| 1. Elytra always black. | |
| A. Legs mostly red; elytra with close greyish pubescence. | |
| a. Third joint of antennæ in male much longer than second; thorax of a clear red colour | T. PELLUCIDUS, F. |
| b. Third joint of antennæ in male not much longer than second; thorax reddish-testaceous, with a more or less distinct black spot or patch, which is often absent | T. NIGRICANS, Müll.
(v. <i>discoideus</i> , Steph.) |
| B. Legs black; elytra with less close pubescence; thorax black with margins broadly yellow | T. OBSCURUS, L. |
| 2. Elytra testaceous or brownish-testaceous (very rarely black in one or two varieties). | |

- A. Antennæ of male without impressed lines on central joints.
 - a. Antennæ of male long and slender, with the third joint much longer than second T. LITURATUS, *Fall.*
 - b. Antennæ of male shorter and stouter, with the third joint not much longer than second T. DARWINIANUS, *Sharp.*
- B. Antennæ of male with impressed lines on central joints.
 - a. Head narrower, considerably contracted towards base; antennæ longer; thorax with black markings on disc, or with disc entirely black T. FIGURATUS, *Mannh.*
(*v. Scoticus*, *Sharp.*)
 - b. Head broader, scarcely narrowed towards base; antennæ shorter; thorax unicolorous reddish-testaceous T. BICOLOR, *F.*
- iii. Length 4-6 mm.
 - 1. Elytra testaceous; thorax yellow, with a large well-defined discoidal patch black T. HÆMORRHOIDALIS, *F.*
 - 2. Elytra black.
 - A. Elytra with close greyish pubescence; thorax red; third joint of antennæ in male not much longer than second T. ORALIS, *Germ.*
(*lateralis*, *L.?*)
 - B. Elytra with comparatively scanty pubescence; third joint of antennæ in male much longer than second.
 - a. Scutellum black.
 - a*. Thorax black with extreme margins usually yellowish in front T. PALUDOSUS, *Fall.*
 - b*. Thorax red or black with margins reddish or pitchy red T. FLAVILABRIS, *Fall.*
 - b. Scutellum red; thorax red, unicolorous. T. THORACICUS, *Ol.*

T. fuscus, *L.* A large broad and robust species, black, clothed with distinct greyish pubescence, front of head and sides of abdomen reddish-testaceous; thorax red with a black patch in front touching, or nearly touching, anterior margin; head narrower than thorax, scarcely narrowed behind eyes, rugosely punctured, antennæ comparatively short, longer in male than in female, third joint much longer than second, black with baser red; thorax subtransverse or almost as long as broad, with sides rounded, rather coarsely punctured; elytra rugosely punctured, with traces of raised lines; legs black, with the inner side of the front tibiæ and tarsi red, especially in male. L. 11-12 mm.

By sweeping Umbelliferæ, &c.; local and, as a rule, not common; Gravesend, Tottenham, Penge, Mickleham, Westerham, Sydenham, Horsell, Cowley, Cowfold, Dartford, Sheerness, Tonbridge, &c.; New Forest; Glanvilles Wootton; Shipley, near Horsham; it has been recorded from Cleethorpes, Lincolnshire, and by Stephens from Edinburgh, but both these localities appear to require further confirmation.

T. rusticus, *Fall.* Extremely like the preceding, from which it may at once be distinguished by having the dark spot on thorax situated

in the centre and not touching anterior margin, and by the femora being mostly red; the femora, moreover, are stouter, and the posterior angles of thorax are more rounded, and the tooth of the exterior tarsal claw is stronger and sharper. L. 9–11 mm.

On flowers, shrubs, &c.; common and generally distributed throughout the kingdom.

T. lividus, L. Entirely testaceous, with a frontal spot, the breast, part of abdomen, and the posterior knees and tibiæ, and sometimes the intermediate tibiæ, or a part of them, black; eyes black, prominent, antennæ black, with base red; thorax about as long as broad, with anterior angles quite rounded and not apparent, posterior angles marked; elytra clothed with fine greyish pubescence, finely and rugosely punctured, shoulders prominent; legs rather stout. L. 10–12 mm.

Male with the antennæ longer and the fourth to the tenth joints furnished with an impressed line, third joint double as long as second.

Female with the antennæ shorter, simple, third joint not much longer than second.

On flowers and shrubs; common and generally distributed throughout the greater part of the kingdom; not so common, but not rare in the north of England and in Scotland.

V. dispar, F. In this variety the elytra are entirely black, and the intermediate and posterior tibiæ are more broadly dark.

Found in company with the type, but much less common.

T. pellucidus, F. Head black, forehead reddish-testaceous, antennæ dark with base reddish; thorax clear reddish-testaceous, with margins lighter, about as long as broad, with the angles rounded, the posterior ones, however, being slightly marked; elytra black, clothed with rather thick greyish pubescence, closely and rugosely sculptured; legs red, posterior and sometimes intermediate tibiæ black; abdomen red. L. 9–10 mm.

Male with joints 5–10 of antennæ with an impressed line, and the third joint much longer than second.

On flowers and shrubs, &c.; common and generally distributed throughout the kingdom, but not so abundant in Scotland.

T. nigricans, Müll. Very like the preceding, but smaller, and with the thorax of a duller and less clear colour and often marked with a more or less irregular black patch; the elytra are more finely sculptured, and the abdomen is in great part black; the knees of the posterior femora, as well as the tibiæ and tarsi, are black; in the male the third joint of the antennæ is not much longer than the second, and the fourth to the eighth joints are furnished with an impressed line. L. 8–9 mm.

On flowers and shrubs, &c.; common and generally distributed throughout the greater part of England and Wales and Ireland; in the north of England, however, and in Scotland, it is replaced by the variety.

V. discoideus, Steph. (*nec* Ahr.).* This variety has a large black discoidal patch on the disc of thorax, which sometimes covers the whole upper surface except the margins; it is also, as a rule, a little smaller than the type.

Not uncommon in the London district, but as a rule rather scarce, although widely distributed, in England and Wales; in the north of England and in Scotland it is far commoner than the type form. Ireland, Glenarm, Larne.

T. obscurus, L. Entirely black, with the under-side of the first joint of the antennæ, and the margins of the thorax more or less broadly, yellow; the mandibles also and the extreme margins and apex of the segments of the abdomen are testaceous, as well as the tarsal claws; head finely punctured; thorax subtransverse, longer and with sides less rounded in male than in female; elytra very finely rugose, with traces of raised lines, especially in male; legs entirely black. L. 8–10 mm.

Male with the antennæ longer and joints 5–10 with an impressed punctiform line behind, third joint a little longer than second.

Female with the antennæ shorter, simple, third joint scarcely longer than second.

On flowers and shrubs; local; rare in England; Vale of Crucis, Llangollen (Chappell); Sherwood (Turner and Blatch); Church Stretton (Blatch); Scotland, local, Solway, Forth, Tay, Dee, and Moray districts; the species appears to be confined to hilly and mountainous localities.

T. lituratus, Fall. (*rufa*, L.; *maculicollis*, Steph.; *bicolor*, Panz.). This species varies very much in colour; as a rule it is testaceous with the vertex of head, an irregular marking on disc of thorax, and the greater part of the abdomen and legs black; the antennæ are more or less dusky with lighter base; occasionally the thorax and legs are entirely testaceous, and rarely the elytra are black; head finely punctured, antennæ varying in the sexes; thorax about as long as broad, obsoletely punctured, anterior angles rounded, posterior angles almost right angles; elytra very finely sculptured, with distinct traces of raised lines; legs rather robust. L. $6\frac{1}{2}$ –9 mm.

Male with the antennæ much longer than in female, without impressed lines on central joints, third joint about twice as long as second.

Female with the antennæ shorter, third joint of antennæ only slightly longer than second; elytra not covering apex of abdomen; seventh ventral segment sinuate at each side, central lobe sharply incised at apex.

* This variety must not be confounded with the *T. discoideus* of Ahrens, which is quite a different insect, and by reason of the formation of the tarsal claws is placed by Erichson in a separate section.

On Umbelliferæ, &c.; moderately common and generally distributed throughout England and Wales, and probably Ireland; very common in some parts of the Midlands; less common further north; Scotland, scarce, Tweed, Forth, and Tay districts.

T. Darwinianus, Sharp. This species, which was introduced by Dr. Sharp, is closely allied to *T. lituratus*, but may be known by its broader and stouter build, much shorter and stouter antennæ, of which the third joint in both sexes is not much longer than second; the thorax, moreover, is proportionally longer and the elytra proportionally shorter; the general colour is darker, the elytra being often of a more or less dark brownish-testaceous colour, especially towards apex; it is possible the species may be a form of *T. lituratus*, but it appears to be more distinct than others which are regarded as quite separate. L. 8-10 mm.

Found on the coast under seaweed, and not, apparently, on plants or herbage; Scotland, local, Solway and Forth districts (Frith of Forth at Aberlady, &c.); Dr. Sharp has observed that some of the females have the elytra and antennæ deformed (remining one of the apterous females in some of the neighbouring genera), and appear to be in great favour with the males; this fact and the very peculiar habitat make it seem probable that the beetle is a form of a neighbouring species, probably *T. lituratus*, which has been altered by its environment.

T. figuratus, Mannh. This species very much resembles small *T. lituratus*, but differs in having the head more contracted behind and the thorax narrowed in front, and also in the fact that the antennæ in the male have the central joints furnished with impressed smooth lines; the colour is testaceous with the vertex of head, a more or less irregular dark patch on thorax, and the greater part of the abdomen, black; the antennæ are dark, with the base light, and the legs as a rule have the femora broadly dark, but are sometimes entirely testaceous; the elytra are very finely rugose; the head and thorax are occasionally, but very rarely, unicolorous testaceous. L. 6-7 mm.

By sweeping grass and flowers; very local; it was introduced by Mr. Crotch on the authority of four specimens taken at Weston-super-Mare, but was afterwards queried as British; it has, however, occurred in several localities. London district, rare, Chattenden, Chatham, Maidstone; New Forest; Horning Fen (Power); Repton (taken in abundance by Mr. Garneys and myself in a grassy place near a stream and osier bed); Northumberland and Durham district; Scotland, local, Solway, Clyde, Tay, Dee, and Moray districts.

V. Scoticus, Sharp. This variety differs from the type in having the disc of thorax darker, and the vertex of the head more broadly black; the anterior angles of the thorax are more rounded and the antennæ are a little longer, with the third joint somewhat longer in proportion in the male. L. 6-8 mm.

Very local; Rannoch, &c.; it has not, apparently, been found except in Scotland.

T. bicolor, F. Rufo-testaceous, with the eyes, breast, middle of

abdomen, and the posterior, and sometimes the intermediate knees, black; head large, about as broad as thorax, not or scarcely narrowed behind eyes, antennæ comparatively short, with third joint long, much longer than second; thorax about as long as broad, feebly rounded at sides, anterior angles rounded, posterior angles very blunt; elytra distinctly pubescent, finely and rugosely punctured, with traces of raised lines; femora robust, external tarsal claw armed with a strong tooth nearly reaching middle. L. 6-7 mm.

Male with joints 4-10 of the antennæ furnished with a smooth impressed line behind, and the third joint longer in proportion to the second.

On flowers, &c.; also on oak and other trees; common and generally distributed throughout the kingdom.

T. hæmorrhoidalis, F. (*clypeatus*, Ill.). Testaceous, with the head, except front, and a discoidal spot on thorax, black; the latter is well defined, and is broader at base and narrowed in front; the breast and the abdomen, except the apex and the sides and margins of the segments, are also black, and the scutellary region is sometimes darker; head narrower than thorax, antennæ slender, slightly fuscous with base lighter; thorax subquadrate; elytra pubescent, somewhat obsoletely rugose; legs testaceous, with the posterior femora often more or less dark, external tarsal claw armed with a strong sharp tooth almost reaching middle. L. 5-6 mm.

Male with joints 5-9 of the antennæ with a smooth impressed line, third joint longer in proportion to second.

On flowers, &c.; local; London district, not uncommon; Hastings; Dover; New Forest; Glanvilles Wootton; Swansea; Chat Moss; Birmingham district; Repton; York; Lancaster; Northumberland and Durham district; Scotland, Solway district, and probably other localities.

T. oralis, Germ. (*lateralis*, L.?). Head black, with front yellow, as broad as, or broader than, thorax; antennæ yellowish-red, longer in male than in female; thorax subquadrate, parallel-sided, reddish-testaceous with margins lighter; elytra black, with margins yellow, clothed with thick greyish pubescence, which gives them a leaden appearance, and with a mixture of longer whitish-yellow hairs, some spots or patches being left bare and raised, especially at base, upper surface finely rugose; under-side of head reddish-yellow, with a black marking, breast black, abdomen black with the apex, sides, and margins of segments yellow; legs reddish-yellow. L. $3\frac{1}{2}$ -5 mm.

Male with joints 4-9 furnished with a smooth impressed line behind, and with the third joint not much longer than second; external tarsal claw armed at base with an erect tooth.

On flowers, grass, rushes, &c.; local and commoner on and near the coast than inland; London district, Kent and Surrey not uncommon; Mickleham, Caterham, Shirley, Lee, Chatham, Sheerness, Gravesend, Southend, Epping, Tottenham, Dagen-

ham, Ruser; Whitstable; Deal; Hastings; Glanvilles Wootton; Devon; Bristol; Knowle; Bewdley; Lincoln; Llangollen; Lancaster district; not recorded from the northern counties of England or from Scotland; Ireland, Armagh (one specimen, Johnson).

T. paludosus, Fall. (*boreellus*, Zett.). Elongate, black, with the mandibles, the basal joints of the antennæ, at all events beneath, and the knees, yellow, or dusky yellow; antennæ long in male, rather short in female; thorax quadrangular with the anterior angles rounded, and the posterior angles obtuse but marked, margins obscurely yellowish; elytra long, rugosely punctured, with feeble traces of raised lines. L. 5-6 mm.

Male with joints 5-10 of the antennæ with a smooth impressed line behind, third joint double as long as second.

Female with the antennæ simple, and the third joint only a little longer than second.

On flowers, in damp meadows in and near woods, especially on *Caltha palustris*; usually found in northern and mountainous districts; Snowdon (Brewer); Glossop, Derbyshire (Chappell); Northumberland and Durham district; Scotland, local, Solway, Tweed, Clyde, Tay, Dee, and Moray districts.

T. flavilabris, Fall. Colour variable; elytra and scutellum always black, head black with mouth parts yellow; thorax black with pitchy or reddish margins, or red with disc black, or entirely red; antennæ longer in male than in female, dark, with base yellow; head finely punctured, nearly as broad as thorax; thorax quadrangular with the anterior angles rounded and the posterior angles obtuse; elytra coarsely and rugosely sculptured; under-side black with sides, apex, and margins of segments more or less red, sometimes entirely red; legs yellow, with tarsi pitchy, and femora more or less dark in the specimens with dark thorax, external claw armed with a sharp tooth reaching middle. L. 5-6 mm.

Male with joints 4-9 of the antennæ with a short impressed line behind, third joint double as long as second.

Female with the antennæ simple, and the third joint one and a half times as long as second.

On flowers and by general sweeping; generally distributed and common throughout England and Wales; Scotland, local, but widely distributed; Ireland, Dublin, Belfast, Larne, &c., and probably general.

The variety of this species with the thorax entirely red is often mistaken by beginners for *T. thoracicus*, which may, however, be at once known by its red scutellum; the dark varieties may be known from *T. paludosus* by their lighter legs and more coarsely sculptured elytra.

T. thoracicus, Ol. (*fulvicollis*, Redt.). A somewhat slender and narrow species, which may at once be known from its allies by its red scutellum; head black with mouth parts yellow; antennæ dark with

base yellow, or yellowish with apex gradually darker; thorax bright reddish-yellow, with anterior angles rounded, and posterior angles rather marked; scutellum reddish-yellow; elytra black, rather coarsely and rugosely sculptured; under-side reddish-yellow, breast sometimes more or less dark; legs clear reddish-yellow, with tarsi somewhat darker, external claw armed with a sharp tooth at base. L. 5 mm.

By sweeping long grass and flowers; very local; Sydenham, Notting Hill, Belvedere, Aylsham, Tonbridge; Shipley, near Horsham; Southend; Pegwell Bay; Hastings; Dover; Glanvilles Wootton; Swansea; Dunham Park, Manchester; Repton, Burton-on-Trent (where I once found the species abundantly in an osier bed at the bottom of the village, but I have never met with it in any other locality, nor does Mr. Blatch record it from the Midlands); York; Cumberland; Scotland, very local, Solway district, found in numbers near Dumfries by Mr. Lennon, but has not occurred in any other place; the distribution of the insect is very peculiar.

RHAGONYCHA, Eschscholtz.

This genus is distinguished from *Telephorus* by having the tarsal claws apparently bifid, the tibiae more slender and straighter, and the tibial spurs, much less distinct; there are fifty-three European species, of which seven are British.

- I. Length 10-11 mm.; thorax reddish-yellow, elytra unicolorous testaceous R. UNICOLOR, *Curt.*
- II. Length 4-8 mm.
 - i. Thorax yellowish-red, unicolorous; elytra red or yellowish-testaceous, with apex black.
 - 1. Head black; elytra yellowish-testaceous R. FUSCICORNIS, *Ol.*
 - 2. Head and elytra red R. FULVA, *Scop.*
 - ii. Thorax black with sides more or less broadly yellowish.
 - 1. Femora entirely yellow R. TESTACEA, *L.*
 - 2. Femora black R. LIMBATA, *Thoms.*
 - iii. Thorax unicolorous black.
 - 1. Elytra yellow-testaceous R. PALLIDA, *F.*
 - 2. Elytra black R. ELONGATA, *Fall.*

R. unicolor, *Curt.* (*translucidus*, *Brit. Cat.*; *pilosa*, *Steph., Er., nec Payk.*). A large and conspicuous species, which may be known from other species with a red thorax by its very prominent eyes, and the strong contraction of the head behind eyes; the British specimens that I have seen all have the upper side of a unicolorous reddish-testaceous colour, with the head and thorax redder than the elytra, but occasionally the elytra appear to be dusky, especially about scutellum; the upper surface, especially of the elytra, is clothed with rather long yellowish pubescence; head with a depression between eyes, which are very large and prominent, antennae very long, especially in male; thorax longer than broad, and somewhat contracted in front (in this respect, however, the insect appears to be somewhat variable, as I have one specimen, a female, in which the thorax is subtransverse with sides subparallel); elytra long, rugosely punctured, with traces of raised

lines; legs clear reddish-yellow, external claw armed with a tooth at base; under-side reddish or dusky, with apex, sides, and margins of segments more or less red. L. 10-11 mm.

Male with joints 5-10 with a small impressed line at base, third joint double as long as second.

Female with the antennæ simple, and the third joint one and a half times as long as second.

On flowers and by sweeping long grass in woods; rare; Darenth Wood, Seven-oaks, Ripley, Maidstone; Shipley, near Horsham; Guestling, near Hastings; Devon; Llangollen; Bewdley; Cannock Chase; Bretby Wood, near Repton; Ripon; Marple, Cheshire; Northumberland and Durham district; Scotland, very rare, in woods, Solway district.

R. fuscicornis, Ol. (*v. Maerkelii*, Kies.). Head, apex of elytra, and chief part of under-side black, thorax reddish-testaceous, elytra, except apex, testaceous or brownish-testaceous; head finely punctured, antennæ fuscous, with base usually somewhat lighter; thorax quadrangular, subtransverse, with anterior angles obtuse, and posterior angles well marked; scutellum rather large, fuscous; elytra clothed with long and scanty yellowish pubescence, with coarse and shallow rugose sculpture; legs yellow, with tarsi sometimes slightly fuscous; prosternum and apex of abdomen testaceous. L. 6-7 mm.

Antennæ longer in male than in female, and elytra widened behind in the latter sex.

By beating hawthorn-flowers, sweeping, &c.; not uncommon and rather generally distributed from the Midlands southwards; rarer further north; Northumberland and Durham district, rare; it has not, apparently, been hitherto found in Scotland.

R. fulva, Scop. (*melanura*, Ol.). Head and thorax clear red, elytra of a deep reddish-testaceous colour with the apex rather broadly black, under-side red or more or less dark; head finely punctured, antennæ long, black with red base; thorax longer than broad, narrowed in front, uneven, depressed in middle; scutellum red; elytra with rather long pubescence, rugosely sculptured, with traces of raised lines; legs clear red, tarsi black with red claws. L. 6-8 mm.

Male with the head broader and the eyes more prominent than in female; the thorax also is longer than in the latter sex.

On flowers, especially Umbelliferæ; extremely common in late summer and early autumn; the most abundant of all our species.

R. testacea, L. This and the following are the smallest of our species; head and under-side black; thorax black with side margins broadly testaceous; antennæ fuscous with base more or less broadly yellowish; elytra and legs entirely yellow-testaceous; head very closely punctured, thorax transverse broader than long or subquadrate; scutellum dark; elytra with long pubescence and with shallow rugose sculpture and traces of raised lines, broader behind in female than in male. L. 4-5 mm.

Male with the penultimate ventral segment broadly emarginate at

apex, female with the last ventral segment very slightly sinuate on each side at apex.

On flowers, by sweeping grass, &c.; local; London district, not common, Chatham, Leith Hill, Esher, Woking, Birdbrook, Aylsham, Tonbridge, Tilgate Forest; Hastings; New Forest; Glanvilles Wootton; Devon; Dean Forest; Swansea; Cannock Chase; Trench Woods; Robins Wood, Repton; Knutsford, Cheshire; Leyburn, Yorkshire; Bowdon, Manchester; not recorded from the Northumberland and Durham district, but probably occurs; Scotland, local, Solway, Tay, Dee, and Moray districts; Ireland, near Dublin, Armagh, Belfast, Larne, &c.

R. limbata, Thoms. (*testaceus*, var., *auct.*). Very like the preceding, but easily known by having the femora more or less broadly dark, and the whole of the margins of the thorax testaceous; the colour, however, is variable to a certain extent, and would not be enough to constitute the insect a separate species; Thomson, however, has pointed out that the sexual characters are different, the male having the seventh ventral segment depressed and subtruncate at apex, and produced into a tooth on each side, and the female having the last ventral segment slightly emarginate at apex. L. $3\frac{1}{2}$ –4 mm.

By sweeping flowers, grass, &c.; much commoner than the preceding, and generally distributed throughout the country; it is extremely abundant in the Midlands.

R. pallida, F. (*pallipes*, F.). A narrow, elongate, and graceful species; head, thorax, and under-side black, elytra of a light testaceous colour; head finely punctured, considerably different in shape in the sexes, antennæ long and slender; thorax about as long as, or a little longer than, broad, extremely finely punctured, narrowed in front, with an obsolete central channel; scutellum black; elytra with long and scanty pubescence, sculpture rugose and shallow; legs clear yellow. L. 5–7 mm.

Male with the head broader than in female, and the eyes very large and prominent, and the third joint of the antennæ longer in proportion to the second; the antennæ are much longer in the former sex than in the latter.

By sweeping and beating in woods; common and widely distributed throughout England and Wales and the greater part of Scotland; Ireland, Armagh, Belfast, and Dublin, and probably common.

R. elongata, Fall. (*paludosa*, Redt., *nec* Fall.). Elongate, entirely black, with the base of the antennæ and tibiæ, and, as a rule, the apex of femora and more or less of the tarsi testaceous or obscurely testaceous; head varying in the sexes, antennæ longer in male than in female; thorax subquadrate, slightly narrowed in front, with a more or less obsolete depression or channel in middle of disc, posterior angles well marked; elytra broader than thorax, with rather long and scanty greyish pubescence, rather closely and rugosely punctured, with traces of raised lines; under-side black, with margins of segments often a little lighter. L. 5–6 mm.

Male with the antennæ longer than in female, the head broader and the eyes more prominent; the third joint of the antennæ, also, is somewhat longer in proportion.

On Scotch fir; local, and only found in Scotland in the Tay, Dee, and Moray districts.

It seems rather doubtful whether we possess *R. atra* as British; this species appears to be very closely allied to *R. elongata*, but to be rather smaller on the average, with the thorax somewhat transverse, and the pubescence of the elytra more scanty; there are also said to be differences in the colour of the base of the antennæ and legs, but these differences are certainly presented by specimens of *R. elongata*; the species is said by Thomson to occur on the spruce fir ("på barren af Gran"), whereas *R. elongata* occurs on the pine or Scotch fir ("på barren af Fur").

MALTHINUS, Latreille.

This genus contains about fifty or sixty species, which are chiefly found in Europe and the circum-Mediterranean region; representatives, however, have occurred in Siberia, Ceylon, South America, &c.; they closely resemble the species of the succeeding genus, and like them have the elytra much abbreviated, with the apex, as a rule, sulphureous yellow, and the wings exposed; they differ in having the mandibles armed with a tooth on their inner margin, the insertion of the antennæ at some distance from the eyes, and the close and rugose punctuation of the vertex of the head and the greater part of thorax; the integument in the species of both genera is very soft and fragile; the insects are found on trees and shrubs, and are very active, taking to wing very rapidly, and soon escaping unless quickly captured; of the thirty-seven European species of *Malthinus* four are found in Britain.

I. Apex of elytra of a bright sulphureous yellow colour.

i. Elytra with very obsoletely punctured striæ; length

$4\frac{1}{2}$ – $5\frac{1}{2}$ mm. M. PUNCTATUS, Fourc.
(*flaveolus*, Payk.)

ii. Elytra with distinct and rather strongly punctured striæ; length 3 – $3\frac{1}{2}$ mm.

1. Posterior legs yellow; general colour lighter . . . M. FASCIATUS, Ol.

2. Posterior legs fuscous; general colour darker . . . M. BALTEATUS, Suffr.

II. Elytra black, unicolorous, obsoletely punctured . . . M. FRONTALIS, Marsh.

M. punctatus, Fourc. (*flaveolus*, Payk.). Rather a large species; head large, strongly contracted behind eyes, which are prominent, vertex black, rugosely punctured, front broadly yellow, antennæ slender, reaching to about the apex of the elytra, fuscous or yellowish-brown with light base; thorax longer than broad, rugosely punctured, with a fovea before base, posterior angles marked; scutellum yellow; elytra broader than thorax, greyish, with the base and suture and a spot before apex darker, apex sulphureous yellow, punctuation fine and obsolete;

under-side yellow, breast and under-side of head blackish; legs long, clear yellow. L. $4\frac{1}{2}$ – $5\frac{1}{2}$ mm.

Male with the head very strongly constricted behind, and the thorax yellow, immaculate.

Female with the head moderately constricted behind, and the thorax yellow with disc dark, sometimes dark with margins narrowly yellow.

By beating and sweeping in woods, &c.; on oak, hazel, hawthorn, and other trees and shrubs; generally distributed throughout the greater part of England and Wales, and in many districts, especially in the Midland counties, very common; Scotland, not rare, Solway, Tweed, Clyde, Forth, and Moray districts; Ireland, near Belfast and Armagh, and probably common.

M. fasciatus, Ol. Considerably smaller than the preceding, which it much resembles in general appearance; head and thorax rugosely punctured, the former large and much constricted behind, vertex narrowly dark, front broadly yellow; antennæ comparatively short, not reaching apex of elytra, yellow at base, fuscous towards apex; thorax about as long as broad, broadest just before middle, narrowed in front, with the posterior angles right angles; scutellum either fuscous or yellowish; elytra broader than thorax, of a light grey colour, with the base and a spot before apex, and sometimes suture, dark, apex sulphureous yellow, punctured in rather strong and distinct rows; under-side and legs yellow, breast more or less infusate. L. 3 – $3\frac{1}{2}$ mm.

Male with the posterior tibiæ furnished with a small tubercle on their inner side behind middle.

By beating and sweeping in and near woods; somewhat local but rather common in the London, Southern, and Midland districts of England. I do not, however, know of any localities in England further north than Hunstanton (Norfolk), Cannock Chase, and Glandovey near Barmouth. Ireland, Armagh (Johnson).

M. balteatus, Suffr. (*fasciatus*, var. *b*, Er.). Very closely allied to the preceding, of which it has been by some authors considered a variety or one of the sexes; in general appearance, however, it is very different, being much darker, with the head black with a yellow spot on forehead, and the elytra dark with a grey band about middle; the posterior legs also are fuscous; the general form is smaller and narrower, and the thorax is narrower and longer; the sculpture of the elytra is, perhaps, a little deeper. L. 3 – $3\frac{1}{4}$ mm.

By beating and sweeping in or near woods; scarcer than the preceding species, but not uncommon in the London and Southern districts; it becomes rarer in the Midlands, and I know of no locality further north than Hunstanton, where I have taken it in company with *M. fasciatus*.

M. frontalis, Marsh. This species is very easily known by its colour, which is unicolorous black, with the forehead yellow in the male and pitchy (almost unicolorous) in the female; head rather large, dull, rugosely punctured, antennæ fuscous with lighter base; thorax a little broader than long, with the sides almost straight, slightly narrowed

in front, posterior angles prominent, punctuation rugose; elytra longer in male than in female, broader than thorax, rugosely and obsoletely punctured; legs reddish with tibiæ and tarsi more or less infusate. L. 3-3½ mm.

In the male the head is broader and the antennæ are nearly as long as the body; in the female the head is narrower and the antennæ are short, scarcely half as long as the body.

By beating fir trees, and by sweeping the grass underneath them; not common; Esher, Ripley, Shirley, Ashted, Birch Wood; Brandon, Suffolk; Glanvilles Wootton; New Forest; Somerset; Swansea; Hunstanton, Norfolk; Yardley, near Birmingham; Cannock Chase; Repton; Bretby, near Burton-on-Trent; Ripon; Bowdon, Cheshire; Dunham Park, Manchester; Scotland, Braemar and Aviemore.

MALTHODES, Kiesenwetter.

This genus contains about a hundred and twenty species, of which about a hundred are found in Europe; a few have been described from North America and Ceylon; in general appearance they closely resemble *Malthinus*, but are distinguished by having the mandibles without a tooth, the antennæ inserted near eyes, and the head and thorax almost smooth or finely punctured; eleven species occur in Britain; they are hard to arrange in a table, as the externally evident differences are in many cases slight and misleading, and the chief distinctions are found in the sexual characters; the table given below must therefore be regarded as merely provisional, and must only be taken in conjunction with the detailed descriptions; the species vary very much in size.

I. Elytra with the apex of a bright sulphureous yellow colour.*

i. Thorax plainly margined at sides throughout.

1. Head without eyes as broad as, or broader than, thorax.

A. Thorax with a very narrow yellow border on all margins

M. MARGINATUS, Latr.

B. Thorax with a very narrow yellow border at base, and sometimes at apex

M. MYSTICUS, Kies.

2. Head without eyes slightly narrower than thorax.

A. Elytra longer; thorax unicolorous black .

M. FLAVOGUTTATUS, Kies.

B. Elytra shorter; thorax, as a rule, with a more or less broad yellow border

M. GUTTIFER, Kies.

ii. Thorax not or scarcely margined in middle of sides, with anterior angles projecting.

1. Thorax unicolorous black; size larger . . .

M. DISPAR, Germ.

2. Thorax with margins more or less broadly red or reddish; size smaller.

A. Colour duller, more or less livid; elytra longer in proportion

M. PELLUCIDUS, Kies.

* In *M. mysticus* the elytra are sometimes unicolorous, without yellow apex.

- B. Colour brighter; elytra shorter in proportion *M. MINIMUS, L.*
 (*sanguinolentus*, Fall.)
- II. Elytra unicolorous black, or with the apex of an obscure dirty-yellowish colour.
- i. Thorax not or scarcely broader than long; size larger.
1. Antennæ of male reaching beyond apex of body; anterior and posterior margins of thorax yellowish *M. FIBULATUS, Kies.*
2. Antennæ of male reaching beyond apex of elytra; thorax unicolorous black, or with only the extreme front and hind margins lighter *M. MISELLUS, Kies.*
- ii. Thorax distinctly broader than long; size smaller.
1. Length 2-2½ mm.; elytra longer in comparison with abdomen *M. NIGELLUS, Kies.*
2. Length 1-1½ mm.; elytra very short in comparison with abdomen *M. ATOMUS, Thoms.*

M. marginatus, Latr. (*biguttatus*, Panz.). Fuscous black, shining, with all the margins of thorax narrowly, and the epimera, knees, and hind margin of abdominal segments yellowish; apex of elytra sulphureous yellow; antennæ as long as body in male, much shorter in female, entirely fuscous; thorax about as long as broad in male, broader than long in female, shining, extremely finely punctured, with a more or less obsolete central furrow; elytra rugosely and finely punctured, with an intermixture of larger irregular punctures; legs fuscous with knees lighter and femora usually darker. L. 4-5 mm.

Male with the head much broader than thorax, strongly narrowed behind, and the thorax much narrower than the elytra; the penultimate ventral segment of abdomen is deeply emarginate in a semicircle, and the last segment is narrow and cleft from base, forming two styles, which are slightly curved at apex; the dorsal segments are simple.

Female with the head scarcely narrower than thorax, and hardly narrowed behind, the antennæ much shorter, and the thorax scarcely narrower than elytra.

By beating and sweeping in and near woods; common and generally distributed throughout the greater part of the kingdom.

M. mysticus, Kies. Very like the preceding in general appearance; black, shining, with the posterior margins of thorax, and sometimes the anterior margins, very narrowly yellowish; antennæ fuscous, much longer in male than in female; thorax broader than long, with posterior angles right angles; elytra short, subtruncate at apex, more distinctly punctured at apex than at base, with the apex sulphureous yellow, sometimes entirely black, unicolorous; under-side black, with the sides of the basal segments and the apex yellowish; legs fuscous, with knees somewhat lighter. L. 3½-4½ mm.

Male with the head broader than thorax, which is narrower than

elytra; penultimate ventral segment of abdomen deeply emarginate in a semicircle, last segment forming a long style which is cleft from base, with parallel lobes, which are emarginate on their outer side, and reflexed so as to form a hook behind middle; last dorsal segment membranous, not covering the style, dilated at apex and slightly emarginate on its apical margin.

Female with the head scarcely narrower than thorax, which is hardly narrower than elytra; last ventral segment of abdomen deeply incised at apex almost to middle.

By beating and sweeping; rare; Tonbridge; Dean Forest; Glossop; Clifton, near Manchester; Northumberland and Durham district; Scotland, rare, Solway, Tay, and Moray districts.

M. flavoguttatus, Kies. Fuscous black, shining, with the mouth, and the under-side in part, testaceous; head without eyes a little narrower than thorax; antennæ in male longer than the body, pitchy brown with base a little lighter; thorax unicolorous black or pitchy black, broader than long, margined all round, with posterior angles right angles; elytra about two and a half times as long as together broad, with the apex sulphureous yellow, rugosely and obsoletely punctured, more plainly at apex; legs brownish with femora somewhat darker. L. $3\frac{1}{2}$ –4 mm.

Male with the head broader than in female, and with the penultimate and antepenultimate dorsal segments produced in an acute angle on each side; penultimate ventral segment emarginate, last segment produced and forming a moderately curved style, which is triangularly emarginate at apex, but not split from base as in the two preceding species.

By beating and sweeping; local; Aylsham; Glanvilles Wootton; Knowle; Bewdley; Salford Priors; Repton; Cheshire; Scotland, Solway, Tay, and Moray districts.

M. guttifer, Kies. Fuscous black, with the anterior and posterior margins and sometimes all the margins of thorax yellow; head without eyes somewhat narrower than thorax; antennæ pitchy with base lighter, as long as, or longer than, body in male, shorter in female; thorax broader than long, posterior angles right angles, projecting; elytra broader than thorax, about twice as long as together broad, obsoletely punctured rugosely, with distinct traces of raised lines, apex sulphureous yellow; epimera and margins of ventral segments of abdomen yellow; legs fuscous, with knees, and often apex of tibiæ and base of tarsi, yellowish. L. $3-3\frac{3}{4}$ mm.

Male with the head broader than in female; thorax a little narrower than the elytra; last dorsal segments of abdomen elongate, the penultimate somewhat raised at apex, the last deflexed, slightly emarginate at apex; penultimate ventral segment deeply emarginate in a semicircle, the last forming a slightly curved style, which is cleft from base, the lobes being parallel and acuminate and simple.

Female with the head narrower, not constricted behind, and the thorax scarcely narrower than the elytra.

By sweeping and beating; apparently rare, but it is possible it may be overlooked or confused with other species; Bishops Wood and Claygate (Power); Thornton Reservoir and Markfield, Leicestershire (Power); Cannock Chase (Blatch); Scotland, rare, Solway, Clyde, Tay, and Moray districts (Sharp, Champion, and others).

M. dispar, Germ. (*neglectus*, Muls.). Pitchy black, shiny, with the mouth and base of antennæ, and the apex of abdomen and the margins of the ventral segments, yellow; elytra with apex sulphureous yellow; head without eyes a little narrower than thorax; antennæ rather stout, reaching in male somewhat beyond apex of elytra; thorax a little broader than long, unicolorous black, shining, anterior margin straight in middle and obliquely cut off on each side, scarcely margined in middle of sides;* anterior angles blunt, projecting, posterior angles right angles; elytra about two and a half times as long as together broad, irregularly and obsoletely and rugosely punctured; legs yellowish with femora usually darker. L. $4-4\frac{1}{2}$ mm.

Male with the head broader than in female, constricted behind; the last dorsal segment short, the penultimate produced into a tooth on each side, the antepenultimate furnished on each side with a long process which is hooked at apex; penultimate ventral segment deeply emarginate at apex, the last forming a long style, which projects beyond the last dorsal segment, and is angularly curved in the middle, channelled to base, and narrowly incised at apex.

Female with the head narrower, with the temples swollen.

By beating and sweeping in and near woods; local; London district, rare, Mickleham, Woking, Weybridge, Darenth, Hammersmith; Hastings; New Forest; Thornton Reservoir, Leicestershire; Repton; York; Whalley Range, Lancashire; Stretford, near Manchester; Northumberland and Durham district, rare, Gosforth, banks of Irthing, and Hetton Hall near Belford; Scotland, local, Solway district.

M. pellucidus, Kies. Of a fuscous livid colour, with the anterior and posterior and sometimes all the margins of the thorax reddish-yellow or yellowish; antennæ fuscous, with the base not lighter; legs fuscous, with the knees and anterior tibiæ pale; margins of ventral segments yellow, elytra sulphureous at apex; thorax broader than long, hardly visibly punctured, not margined at sides, anterior angles blunt but projecting, posterior angles marked; elytra about three times as long as broad, distinctly broader than thorax, and rather broader than the head with eyes, rugosely and obsoletely punctured, somewhat alutaceous; femora usually darker than the rest of the legs. L. $2\frac{1}{2}-3\frac{1}{2}$ mm.

* Thomson says of this species, "Prothorax lateribus immarginatis;" whereas Kiesenwetter says, "Es ist ringsherum, am deutlichsten an den Vorderecken gerandet." This instance will serve to show the difficulty of tabulating the species by externally apparent differences

Male with the head broader than in female, and narrowed behind; dorsal segments of abdomen simple and not elongate; penultimate ventral segment deeply emarginate, the last forming a slightly curved style, which is not dilated at apex, channelled at base beyond middle, and not split or incised.

By beating young birches, sweeping herbage, &c.; rare in England; Sevenoaks, Woking, Caterham, Esher, Tilgate Forest; Yardley near Birmingham, Trench Woods, and Rodborough Common (Blatch); near Manchester, rare; Northumberland and Durham district, not common, but widely spread over the district; the species is, however, recorded by Dr. Sharp as common in Scotland, in the Solway, Tay, Dee, and Moray districts.

M. minimus, L. (*sanguinolentus*, Fall.). This, the commonest of our species, is easily known by its bright colouring, the thorax being often of a clear reddish-yellow colour, with or without a small dark spot on disc; occasionally the greater part of the upper surface is dark, but the margins are always distinctly lighter; antennæ fuscous, with base yellow; abdomen with margins of segments yellow; elytra sulphureous at apex; the head is finely and closely but distinctly punctured, especially on vertex; antennæ in male about as long as the body; thorax subquadrate, with sides almost straight and not or scarcely margined, with all the angles blunt, anterior angles projecting; elytra broader than thorax, about two and a half times as long as together broad, with the pubescence more marked than in most of the species, especially at apex, very finely and rugosely punctured, and somewhat alutaceous; legs clear reddish-yellow, with the femora blackish. L. 3–3½ mm.

Male with the head broader than thorax, and constricted slightly behind; last dorsal segments simple and not elongate, penultimate ventral segment broadly and not deeply emarginate, the last slightly narrowed and produced, subovate, divided from base into two broad rounded lobes.

By sweeping herbage, beating shrubs, &c.; usually in somewhat damp places; common and generally distributed throughout the kingdom.

M. fibulatus, Kies. One of the most distinct and easily recognized of all our species; of a unicolorous greyish or fuscous black colour, with the mandibles, base of antennæ, and the anterior and posterior margins of thorax narrowly, but distinctly, yellow; under-side more or less yellowish; antennæ in male very long, reaching beyond apex of body, much shorter in female; thorax about as broad as long, anterior angles blunt, slightly projecting, posterior angles almost rounded; elytra about two and a half times as long as together broad, very obsoletely and rugosely punctured, darker at base and apex; legs testaceous or fusco-testaceous, with the femora darker. L. 2½–3 mm.

Male with the head broader than in female, and strongly narrowed behind; penultimate dorsal segment produced, emarginate at apex, and sending out on each side two processes, the apical one spiniform (or,

according to Kiesenwetter, with the angles produced into a lobe, which is abruptly narrowed at apex and bent downwards, in a spiniform process), last dorsal segment small, rounded at apex; last ventral segment forming a long and thin and slightly curved style, which is suddenly dilated at apex and triangularly excised.

Female with the head narrower and the temples swollen.

By beating and sweeping in and near woods in early summer; local and usually rare, but occasionally abundant where it occurs; Caterham, Mickleham (in which place Mr. Champion once found it in profusion); Cambridge; Bewdley Forest; Repton; Matlock, Lovers' Walk; Sherwood Forest; Northumberland and Durham district, very rare, "Hartford Bridge in May" (Bold); Scotland, rare, Forth district.

This species comes rather near the variety of *M. mysticus* with immaculate elytra, but may be known by the colour of the thorax, which is also less transverse; from *M. misellus* it may be known by the colour of the thorax and antennæ, and the longer antennæ of the male.

As the species of *Malthodes* and *Malthinus* open their wings almost as soon as they touch the surface on to which they are beaten, the species with the apex of the elytra immaculate are very easily passed over by collectors as being Dipterous or Hymenopterous insects, among the swarm of Diptera and small Hymenoptera that are always beaten off shrubs in May and June.

M. misellus, Kies. Of a unicolorous fuscous-black or greyish-black colour; under-side more or less yellowish; head finely punctured; antennæ of male reaching apex of elytra, fuscous with the first joint sometimes a little lighter, but not clear yellow as in the preceding species; thorax subquadrate, anterior angles blunt, but slightly projecting, posterior angles rounded, unicolorous black with the very extreme anterior and posterior margins sometimes obscurely lighter; elytra broader than thorax, about two and a half times as long as together broad, closely and rugosely punctured; legs lighter or darker fuscous brown, with the knees lighter. L. 3-3½ mm.

Male with the penultimate dorsal segment of abdomen elongate and emarginate at apex, with the external angle produced on each side into a short lobe, which is inflexed at apex; penultimate ventral segment emarginate, last segment forming an elongate slightly curved style, which is emarginate at apex.

By beating and sweeping; rare; Malvern; Repton; Glossop; Matlock; Clifton, near Manchester; Scotland, rare, Solway district.

M. nigellus, Kies. (*brevicollis*, Thoms., *nec* Payk.). Black or greyish-black, with the elytra unicolorous; head shining black, with the eyes about as broad as thorax; antennæ rather short, not reaching the apex of elytra, black or pitchy, with the first joint sometimes lighter;

thorax double as broad as long, shining black, with the anterior angles, and to a lesser degree the posterior angles, elevated and somewhat prominent, with three impressed foveæ, one on disc and two near anterior angles; elytra broader than thorax, about two and a half times as long as together broad, rather plainly and rugosely punctured; under-side black; legs lighter or darker pitchy brown, with the tibiæ and tarsi a little lighter, and the knees light brownish-yellow. L. $2-2\frac{1}{2}$ mm.

Male with the head narrower than in female; dorsal segments of abdomen elongate, reaching beyond the ventral segments, the last narrowed; penultimate ventral segment deeply but narrowly incised, last segment forming a short and straight, slender and shining style, which is suddenly dilated and split into a fork at apex.

By beating and sweeping; apparently very rare; it was first introduced somewhat doubtfully by Mr. Crotch on two female specimens, and specimens taken by Dr. Power at Mickleham and Purley oaks have been referred to it, but one of those now before me does not appear to differ from *M. atomus*; Mr. Blatch records it from Church Stretton, Cheshire.

M. atomus, Thoms. (*brevicollis*, Payk. *et* Kies., *nec* Thoms.). This species may at once be known by its very small size, and by its colour, which is greyish-black with the posterior margin of thorax and the apex of the elytra of a dirty yellowish-testaceous colour; the head with eyes is a little broader than thorax; antennæ rather stout, not reaching apex of elytra, brownish or blackish; thorax more than double as broad as long, uneven, with all the angles somewhat prominent; elytra about two and a half times as long as together broad, scarcely covering half the abdomen, finely punctured, alutaceous, somewhat transparent; under-side greyish-yellow or greyish-brown; legs fuscous or fuscous-yellow. L. $1-1\frac{1}{3}$ mm.

Male with the last dorsal segments of abdomen elongate, the last deeply cleft, with the lobes filiform; penultimate ventral segment roundly emarginate, produced on each side into an elongate lobe, which is sharp at apex, the last forming a thin strongly curved style, which is forked at apex.

Female with the head rather narrower than in male, and the antennæ almost moniliform, and the last ventral segment of abdomen incised in the middle.

By beating and sweeping in and near woods; local, but not uncommon where it occurs; London district, rather common and generally distributed; Mr. T. Wood records it as taken at Dulwich by night sweeping only; Glanvilles Wootton; New Forest; Devon; Chat Moss (on sallows); Northumberland and Durham district, rare; Scotland, local, Solway, Tweed, Dee, and probably the intervening districts; Ireland, Portmarnock and near Belfast. I know of no record from the Midland counties of England, or from Wales; the insect is, however, in all probability, often passed over.

This species, as Thomson observes, is distinguished from all the others by its small size and the almost moniliform antennæ of the female, and

also by the very short elytra, which hardly reach the middle of the abdomen, and are obscurely yellowish-testaceous at apex.

Of all the genera of the Coleoptera there is hardly one that presents more difficulties than *Malthodes*; the reason of this lies chiefly in the fact that the integument is so soft and fragile that in dead specimens it is apt to shrivel considerably and alter its shape; the delicate male characters therefore require to be examined in fresh or living specimens, or else are wont to appear different to different describers; as this is in many cases impossible, considerable difficulties have arisen; again, the external differences are often comparative, and the colour is variable, so that with regard to the size of head, shape of thorax, &c., the chief writers of the group sometimes give diametrically opposite descriptions; with regard to our own species, I do not in all cases feel at all certain of their identity, and it would be of very great advantage if some accurate worker would carefully examine and monograph them.

MELYRIDÆ.

This family contains about seventy genera and a large number of species, which are widely distributed over the surface of the globe, but are perhaps more characteristic of temperate than of tropical countries; about thirty genera and four hundred species are found in Europe; the species are characterized by having the antennæ inserted in front of the eyes on the produced part of the head, the labrum distinct, and the feet often furnished beneath with membranous pads or lobes; the prosternum is short, not extending between the coxæ, and the coxal cavities are large, transverse, and open behind; the elytra sometimes cover the abdomen, and sometimes are abbreviated; the abdomen is composed of six free ventral segments, the sixth being occasionally indistinct; legs rather long and slender, tarsi in all our species 5-jointed with the fourth joint entire; antennæ serrate or pectinate, filiform, or very rarely moniliform, often singularly distorted; body often very hairy; this is especially noticeable in the Spanish genus *Henicopus*, which is not represented in our fauna.

The family may be divided into two tribes, as follows:—

- I. Body with extensible vesicles; antennæ filiform, sometimes slightly serrate MALACHIINA.
- II. Body without extensible vesicles.
 - i. Antennæ serrate; tarsal claws with or without membranous appendages DASYTINA.
 - ii. Antennæ moniliform, with the three apical joints larger; tarsal claws simple PHLEOPHILINA.

MALACHIINA.

The members of this tribe are characterized by the presence of lateral extensible vesicles, which proceed from a fissure beneath the anterior

angles of thorax, and the sides of the first abdominal segment; the abdomen is composed of six distinct ventral segments; the antennæ are filiform or moniliform, sometimes slightly serrate, especially at base; the species are in many cases very brightly coloured, and are found on herbage and flowers, usually in damp or marshy situations.

- I. Antennæ inserted on the front almost between the eyes.
 - i. Male with the second joint of anterior tarsi not produced; size larger MALACHIUS, *F.*
 - ii. Male with the second joint of anterior tarsi obliquely produced at apex; size smaller AXINOTARSUS, *Mots.*
- II. Antennæ inserted on the sides of front ANTHOCOMUS, *Er.*

MALACHIUS, Fabricius.

This genus in its widest sense contains considerably more than a hundred species, of which about fifty occur in Europe; the remainder are chiefly found in the Mediterranean region, Northern Asia, and North America; scarcely any are inhabitants of tropical countries, although two or three have been described from Ceylon and South Africa; four species of the genus proper are found in Britain, which may be distinguished as follows:—

- I. Elytra orange-red with a common longitudinal green band, reaching from scutellum towards apex . . . M. *ÆNEUS*, *L.*
- II. Elytra green with apex orange-red.
 - i. Thorax transverse, green with extreme border of anterior angles often red M. *BIPUSTULATUS*, *L.*
 - ii. Thorax not or scarcely transverse.
 - 1. Thorax unicolorous green M. *VIRIDIS*, *F.*
 - 2. Thorax green or blackish-green with yellowish-red border at sides M. *MARGINELLUS*, *Ol.*

The formation of the antennæ in the male is, in many cases, very extraordinary, and the apex of the elytra in the same sex sometimes presents striking modifications; in fact, owing to these peculiarities, the sexes have sometimes been described by older writers as distinct species; the processes of the antennal joints are evidently used by the male for holding the antennæ of the female during coupling, and answer in some sense to the suckers of the male Dytiscidæ.

M. æneus, *L.* Rather broad, clothed with fine whitish pubescence, and besides this with long black outstanding hairs; head and thorax bronze-green, the former with the front yellow, the latter with the anterior angles orange-red; antennæ rather stout, green with the under-side of the first three joints reddish (more plainly so in male than in female); head large and broad, thorax transverse, with all the angles rounded, smooth and shining, impressed near posterior angles; scutellum transverse; elytra dull, feebly rugose, orange-red with a long triangular common band reaching from base to beyond middle, and sometimes almost to apex; under-side bronze-green, epimera of mesothorax

reddish; legs rather long, dark, metallic, with tarsi sometimes pitchy. L. 6-7 mm.

Male with the second joint of the antennæ produced in a point internally at apex, third joint armed at apex with a long curved hook, nearly meeting the produced process of second joint, forehead with a deep transverse impression in front, clypeus swollen.

Female with the antennæ and forehead simple.

On flowers, &c., especially in woods; local; London district, rather common; Darenth Wood, Woking, Horsell, Belvedere, Tilgate, Epping, Chatham, Sheerness, Southend, Tonbridge; St. Leonards; Gosport; New Forest; Glanvilles Wootton; Barnstaple; Swansea; Knowle, near Birmingham; Repton; Knutsford, Cheshire; Northumberland and Durham district, rare, Stockton and Newcastle; the species has not, apparently, been found in Scotland.

M. bipustulatus, L. Of a bright metallic green colour, rarely bluish, with the mouth parts yellow, and the apex of elytra, and the extreme anterior angles of the thorax, orange-red; the extensible vesicles at the anterior angles of thorax are always visible in this species, and, as they are of a bright orange-red colour, they make the anterior angles appear more broadly red than they really are; head very finely punctured, dull; thorax transverse, with the sides and angles rounded, depressed at posterior angles; elytra feebly rugose, with very faint traces of raised lines; pubescence much as in the preceding species; under-side dark, metallic, with sides of mesosternum yellowish-red; legs metallic green. L. 5-5½ mm.

Male with the basal joints of the antennæ whitish-yellow beneath, second joint furnished beneath with a large broad curved appendage, third joint small, with a projecting tooth, fourth joint with a large hooked process nearly meeting the process of the second joint, fifth joint somewhat dilated; forehead with a deep transverse impression, clypeus swollen.

On flowers, and by general sweeping; very common and generally distributed from the Manchester district southwards; it is, apparently, not uncommon in the Northumberland and Durham district, but Dr. Sharp records it as very rare in the Forth and Tay districts of Scotland; he has not apparently met with it at all in the Solway or Tweed districts.

M. viridis, F. Very like the preceding in general appearance, but smaller, with the thorax subquadrate and not transverse and quite unicolorous, and with the apex of the elytra only narrowly reddish; the sexual characters, moreover, are very slight, the male only having the first joint of the antennæ incrassate, and the rest simple, and the forehead and clypeus somewhat swollen in front; the apex of the elytra is occasionally concolorous. L. 4 mm.

On flowers, &c.; local; London district, rather common and generally distributed; Whitstable; Margate and surrounding district; Deal; Brighton; Portsmouth district; Weymouth; Devon; Cambridge; Trench Woods; it has also been recorded from Carlisle.

M. marginellus, Ol. (*♂ bispinosus*, Curt.). In size and general appearance this species much resembles *M. bipustulatus*, but may at once be known by the shape and colour of the thorax, which is about as long as broad and suborbicular, of a bright green or bluish-green colour, with the sides rather broadly and very clearly and sharply orange-red; the anterior and intermediate tarsi, especially the former, are reddish, as also is the apex of the elytra; the male characters will also at once separate the species; in this sex the second joint of the antennæ is very small and simple, and the five following are excavate internally, and are produced at apex into a more or less distinct and prominent blunt tooth; the apex of the elytra, moreover, is much reflexed, so that it almost appears broken in, and each elytron is furnished near the sutural angle with a long sharp spinose tooth, the sutural angle itself being also dentate; the forehead and clypeus are swollen. L. 5 mm.

On flowers, &c.; very local, but sometimes common where it occurs; Folkestone and Whitstable (on flowers of *Honkeneya peploides* near the coast (Champion)); Birchington; Deal; Hastings; Portsmouth district; Eastbourne; Devon; Scotland, very rare, Solway district (Sharp); Stephens records it from Norfolk, Suffolk, Essex, Kent, and Slapton Ley, Devon; its occurrence in Scotland is worthy of note, as it seems otherwise almost confined to the south-eastern coast.

AKINOTARSUS, Motschulsky.

The members of this genus were formerly included under *Malachius*, from which they may be known by having the second joint of the anterior tarsi in male obliquely produced at apex, and their smaller size; there are eight European species, of which two are found in Britain.

- I. Thorax black with side margins broadly yellowish-red *A. PULICARIUS*, Fab.
- II. Thorax entirely red *A. RUFICOLLIS*, Ol.

A. pulicarius, F. Of an obscure green or blackish-green colour, shining, clothed with fine greyish pubescence, elytra with scattered coarse upright black hairs; mouth parts yellow, thorax black with the sides very broadly and sharply yellow or yellowish-red; head large, antennæ very long in male, shorter in female, more or less testaceous, at all events on the under-side of the joints; thorax a little narrower than elytra, about as long as broad, suborbicular, impressed at posterior angles, very finely punctured; elytra very obsoletely and finely punctured with the apex rather broadly yellowish; legs blackish-green, with the anterior tarsi testaceous. L. 3–3½ mm.

Male with the antennæ longer, and the elytra deeply and bluntly inflexed at apex obliquely.

By sweeping Umbelliferæ, &c.; local and not common; Claygate, Surrey; Wandsworth (Waterhouse); Peckham and Walworth (Stephens); Charlton in some numbers (Lewis).

A. ruficollis, Ol. (*rubricollis*, Marsh.). Of about the same size as

the preceding, but with the elytra rather strongly widened behind, and easily distinguished by having the thorax entirely red; head large, dark green, antennæ black with the under-sides of the joints, to a greater or less extent, yellowish; thorax a little narrower than elytra, slightly transverse, impressed near posterior angles; elytra very finely punctured, alutaceous, dark green with apex yellow; legs dark, anterior tarsi brown. L. 3 mm.

Male with the antennæ longer and the apex of elytra strongly and bluntly reflexed obliquely, with a small black appendage.

In grassy places; by sweeping; local, but sometimes found in numbers where it occurs; London district, not uncommon, Beckenham, Weybridge, Ripley, Dulwich, Richmond, Reigate, Erith, Loughton, Tonbridge, &c.; Hertford; Brandon, Suffolk; it has also been recorded from Bristol, but appears to be almost entirely confined to the London and South-eastern districts.

ANTHOCOMUS, Erichson.

The species belonging to this genus much resemble those belonging to the preceding, but differ in the insertion of the antennæ, and the simple anterior tarsi of the male; they are about thirty in number, and are widely distributed, occurring in Europe, Africa, North, Central and South America, &c.; they are small insects, as a rule very brightly and prettily coloured, and are found by sweeping flowers and herbage in damp or marshy localities; of the seven European species three are found in Britain, one of which is referred by Mulsant to his sub-genus *Carapheles*.

I. Antennæ short, feebly serrate; thorax more or less dark.

1. Thorax dark with sides broadly red; elytra red . . . A. RUFUS, *Herbst.*
(*sanguinolentus*, F.)

2. Thorax entirely dark; elytra dark with red fasciæ . . . A. FASCIATUS, L.

II. Antennæ longer, filiform; thorax entirely red . . . A. TERMINATUS, *Mén.*

A. rufus, *Herbst.* (*sanguinolentus*, F.). Rather elongate and parallel-sided, dull, extremely finely and scarcely visibly punctured, clothed with very short and fine pubescence; head greenish-black, large, antennæ rather short, black, serrate; thorax greenish-black with sides rather broadly red, about as broad as elytra, and with the length and breadth almost equal, sides gently rounded; scutellum small; elytra dull scarlet, subparallel, very slightly broader at apex; legs dark. L. $3\frac{1}{2}$ –4 mm.

Male with the elytra reflexed at apex, and furnished with a small black spiniform membranous appendage.

By sweeping aquatic plants, &c.; almost entirely confined to the fen districts; Wicken Fen; Whittlesea Mere; Yaxley Mere; Bexley Mere; Ashwicken; Horning Fen; Crymlyn Bog, Swansea; Stephens records it as "rare near London; has been taken at Ealing on barley," but this appears doubtful.

A. fasciatus, L. Entirely black or greenish-black, with a broad fascia on each before middle, which does not reach suture, and the apex red; the base of the antennæ on its under-side and the knees of the anterior legs are also more or less plainly testaceous; the head with eyes is about as broad as the thorax, which is about as broad as long and a little narrower than the elytra; the antennæ are short, and as in the preceding species, feebly serrate; the elytra are slightly widened behind; the general punctuation and pubescence is extremely fine. L. $3-3\frac{1}{3}$ mm.

Male with the elytra reflexed at apex, and furnished with a small black reflexed lobe, which is bent backwards, and is spinose at its inner angle.

Grassy places; by sweeping; occasionally by beating salwos, willows, &c.; somewhat local, but rather common in many localities. London district, generally distributed; Hertford; New Forest; Glanvilles Wootton; Devon; Swansea; Bewdley; Tewkesbury; Hereford; Repton (rare); Hale and banks of Bollin, Cheshire; it has not, apparently, been recorded from the Northumberland and Durham district, or from Scotland or Ireland.

A. terminatus, Mén. (*festivus*, F.; *ruficollis*, F., *nec* Ol.; *Carpheles terminatus*, Muls.). This species differs considerably from the two preceding by its shorter form and longer and more filiform antennæ; it has by some been confused with *Axinotarsus ruficollis*, Ol., from which it may be at once known by its dull appearance and the fact that the tibiæ and tarsi are of a clear reddish-yellow colour with the onychium and claws only darker; the punctuation and pubescence are extremely fine; the head is rather large, and the antennæ moderately long, with the first joint partly, and the second and third entirely, testaceous, and the rest of a lighter or darker brownish colour; the thorax is a little narrower than the elytra, scarcely transverse; the elytra are widened behind, dark green with the apex reddish-yellow, the colour sometimes covering the apical third; the femora are dark. L. 3 mm.

Male with the elytra reflexed at apex and appendiculate; female apterous.

By sweeping, &c.; apparently very rare; I know of no recent captures, and the specimens I have seen are mostly from old collections; Stephens records it from Whittlesea Mere, and it has also occurred at Mickleham, Monks Wood, and Horning Fen, Norfolk.

DASYTINA.

In this tribe the species are not furnished with lateral vesicles, and have the antennæ usually plainly serrate and inserted on the sides of the head before the eyes; the tarsal claws are with or without membranous appendages, and the sixth ventral segment of the abdomen is sometimes indistinct; the genus *Byturus* is, in some points, closely connected with this tribe, and has, in fact, by some authors

been included under it; as Dr. Horn remarks (Classification of the Coleoptera of North America, p. 213), the affinities of the Malachiidæ appear to conduct directly from the Lampyridæ to the Cleridæ, with a strong tendency to inosculate, through *Byturus*, with the Dermestidæ.

The larvæ of the *Dasytina* appear to be elongate and rather hairy, narrowed in front and widened behind, and terminated by two short pointed cerci; the antennæ and legs are short or very short; those of *Dasytes serricornis* and *Haplocnemus impressus* are figured by Westwood (Classification, i. p. 259, fig. 28, 18 and 22); they are found in old trees, and are, apparently, carnivorous; the perfect insects are usually found on flowers, and are either more or less elongate, or rather short oblong and convex, with the upper surface very often clothed with long and thick hairs.

- I. Tarsal claws broadly toothed, but without membranous appendages DASYTES, Payk.
- II. Tarsal claws with a connate pellucid membrane.
 - i. Tarsi somewhat thickened; upper surface coarsely pubescent PSILOTHRIX, Redt.
 - ii. Tarsi long and slender; pubescence of upper surface almost squamulose DOLICHOSOMA, Steph.
- III. Tarsal claws with a free membrane, which is appendiculate, and as long as the claws; form comparatively short and broad HAPLOCNEMUS, Steph.

DASYTES, Paykull.

This genus contains about one hundred and fifty species, and is probably much more extensive, as its members are distributed over the whole world from Siberia to the Australian region, and throughout Europe, Asia, and North, Central and South America; they are linear and narrow insects, of a dark colour, clothed with more or less long and thick villose pubescence; they are found on flowers and shrubs; about sixty of the known species occur in Europe, of which four only inhabit Britain, one of which is somewhat doubtful.

- I. Thorax not transverse; elytra rather roughly punctured. (Sub-gen. *Mesodasytes*, Muls.)
 - i. Legs, in part at least, testaceous.
 - 1. Eyes smaller in male; female with the second joint only of the antennæ testaceous D. FLAVIPES, F.
 - 2. Eyes larger in male; female with the first and second joints of the antennæ testaceous D. OCULATUS, Kies.
 - ii. Legs entirely dark D. ÆROSUS, Kies.
- II. Thorax slightly transverse; elytra closely and rather finely punctured; colour entirely black (*Dasytes*, i. sp.) . . . D. NIGER, L.

The synonymy of the species is, in some cases, very confused; I have, for convenience sake, omitted the name of *D. plumbeus*, which has been applied by authors to more than one species.

D. flavipes, F. (*plumbeus*, Müll., nec Muls.; *tibialis*, Zett.; *coxalis*, Muls.). Elongate, linear and parallel, a little widened behind in female, of a dark bronze-black olive-greenish colour, with fine light pubescence, and a strong intermixture of long upright blackish pilose

hairs; head rather finely and irregularly punctured, eyes large, antennæ feebly serrate, dark; thorax a little longer than broad, narrowed slightly in front, impressed before and behind middle, sparingly and rather strongly punctured on disc, thickly and somewhat rugosely at sides; elytra elongate, four times as long as together broad, somewhat depressed, thickly, irregularly, and somewhat rugosely punctured; legs slender, femora dark, tibiæ testaceous, tarsi fuscous or fusco-testaceous. L. 4-4½ mm.

Male with the head together with eyes broader than thorax, and the antennæ half as long as the body; fifth ventral segment of abdomen depressed in middle and emarginate at apex.

Female with the head a little narrower than thorax, and the antennæ reaching a little beyond the base of the thorax, with the fifth joint double as large as those before and after it; the posterior tibiæ and tarsi, also, are more or less fuscous.

By sweeping herbage and beating low shrubs, especially in lanes and woods; not uncommon and rather generally distributed in the London district and the South of England and certain Midland districts; I know, however, of no locality further north than Repton, near Burton-on-Trent.

D. oculatus, Kies. This species was introduced by Mr. Crotch, who states that the males may be distinguished by their large globose eyes, the space between which is much narrower than in *D. flavipes*, and that the females have the base of the antennæ and the anterior coxæ testaceous, whilst in the same sex of *D. flavipes* only the second joint of the antennæ is testaceous, the eyes, also, in this sex being less developed; the thorax also in *D. oculatus* is said to be longer and to be without the central furrow which is traceable in *D. flavipes*, and the fourth joint of the tarsi is much shorter and narrower than the third, whereas in the last-named species it is only slightly shorter and narrower. L. 4-4½ mm.

By sweeping herbage, and beating shrubs, in woods, &c.; rare; Darenth Wood; Cobham Park; Chatham; Cowley; Wigmore, Kent; Sherwood Forest; Mr. Crotch's original specimens were taken by Mr. Wollaston in Lincolnshire, probably at Spridlington, near Lincoln.

There seems to be a considerable doubt admissible regarding this species, which is identified by Crotch with the *D. coxalis* of Mulsant and the *D. plumbeus* of Illiger; it is very hard to separate it by the descriptions, and the distinctions are more or less comparative and somewhat variable: Mr. Gorham informs me that he is not sure of the species, and I am glad to find that such an authority on the Malacodermata has found the same difficulty that many others have experienced.

D. ærosus, Kies. (*plumbeus*, Muls., *nec* Müll.; *æratus*, Steph.; *subæneus*, Thoms.; *plumbeo-niger*, Goeze). Very like the two preceding in general shape, and also resembling them in pubescence and punctuation, but easily distinguished by the dark tibiæ, the legs having only the

trochanters and the base of the posterior tarsi testaceous, the latter often very obscurely so; the thorax is shining on disc and has no trace of a central furrow, and the fourth joint of the tarsi is much shorter and narrower than third; the elytra are somewhat roughly punctured; in the male the head is broader than in the female and the antennæ are longer, and the fifth ventral segment of the abdomen is deeply impressed and broadly emarginate at apex; in the female the fifth joint of the antennæ is a little larger than those on each side of it, and joints 7-10 are oblong triangular. L. $4-4\frac{1}{2}$ mm.

By sweeping herbage and beating hedges, in lanes, woods, &c.; rather common and widely distributed in the London, Southern, and Midland districts, and also in Wales; less common further north; Northumberland and Durham district, rare; Scotland, very rare, Solway district, and recorded doubtfully from the Forth district. Mr. Chappell informs me that he has bred it from oak galls from Llangollen.

D. niger, L. Less elongate, and of shorter and broader form than any of the preceding, black, shining, clothed with rather thick and short outstanding black pilose hairs; head broader in male than in female, and with the antennæ longer; in the former sex, however, they only reach a little beyond the base of the thorax; thorax very slightly transverse, a little narrowed in front, especially in the female, broadest behind middle, with the disc more or less thickly punctured, and the sides closely rugose, with a more or less distinct impressed central line in front; elytra rather closely and finely punctured; legs black, tarsi elongate. L. $3\frac{1}{2}-4$ mm.

Male with the fifth ventral segment of abdomen moderately, and the sixth rather strongly impressed.

By sweeping in grassy places; very local and not common; New Forest (where it has been taken by Mr. Champion, myself, and others); the species was introduced into our list in 1871 on the authority of Mr. Champion's specimens, but a single specimen was captured by Dr. Power so long ago as July 21, 1855, at the Holt, near Farnham.

PSILOTHRIX, Redtenbacher.

This and the succeeding genus contain a few species which are chiefly found in the European region; two or three, however, occur in North America; the species belonging to this genus differ from *Dolichosoma* in their somewhat thickened tarsi, shorter and stouter antennæ, somewhat broader form and pubescent upper surface.

P. nobilis, Ill. (*viridis*, Rossi). Of a very bright green or greenish-blue colour, sometimes quite blue, rather shining, elongate and parallel-sided, with elytra somewhat depressed, with sparing pubescence and long erect black hairs; head large, thickly and coarsely rugosely-punctate, antennæ short, metallic green, feebly serrate; thorax about as long as broad, with the sides rounded, thickly and rugosely punctured, with a more or less distinct smooth central line or furrow; elytra rather broader

than thorax, parallel-sided, elongate, rather strongly punctured, but less closely than thorax, with feeble traces of raised lines; legs and under-side metallic green or bluish, the former with the tarsi somewhat incrassate. L. $4-6\frac{1}{2}$ mm.

Male with the last ventral segment of abdomen widely and deeply impressed and broadly emarginate at apex.

On flowers, especially of *Hieracium*; local; occurring as a rule near the coast; Whitstable; Herne Bay; Hastings; Eastbourne; Brighton; Gosport; Isle of Wight, Freshwater, and very common at Sandown in early summer; Weymouth, Chesil Beach; Devon; Cornwall; it is recorded by Bold as a very doubtful native of the Northumberland and Durham district, and the record is probably an erroneous one, as there is no other English record from any counties north of Kent and Surrey; the Rev. J. Bristow records it, however, from near Belfast.

(*P. protensus*, Gené. This species was introduced by Crotch on the authority of specimens from the Isle of Wight, but it appears to be very doubtfully indigenous; it is at its largest about the size of the smallest *P. nobilis*, of a bright green or blue colour, and is especially distinguished by having the punctures of the head and thorax flat at the bottom, and again punctured in the middle; the thorax also is more elongate and the upper surface duller than in *P. nobilis*. L. $4-4\frac{1}{2}$ mm.

It appears to be almost certain that Mr. Crotch's specimens were not the true *D. protensum*, and the species must therefore be omitted from our lists.)

DOLICHOSOMA, Stephens.

This genus, in its restricted sense, contains five European species, of which one is found in Britain; it is easily recognized by its very long and extremely narrow form, and the mealy appearance of the upper surface.

D. lineare, Rossi. Very narrow, elongate, and linear, almost filiform, cylindrical, of a dull obscure bronze-green colour, thickly clothed with short, almost scale-like pubescence, which gives the insect a mealy appearance; punctuation of the whole upper surface very thick and rather fine, but distinct; head with eyes, which are large, rather broader than thorax; antennæ longer in male than in female, very feebly serrate, black, with the second joint testaceous; thorax cylindrical and parallel-sided, double as long as broad, with a more or less distinct central furrow, which is sometimes obsolete; elytra broader than thorax, about five times as long as together broad, dehiscent at apex, with traces of raised lines; under-side rather shining, sparingly punctured and pubescent; legs long and slender, of a dark metallic green colour. L. $5-5\frac{1}{2}$ mm.

Male with the head broader and the antennæ longer than in female, and with the fifth segment of the abdomen transversely depressed behind and furnished with a shining fovea in the centre.

Grassy banks, on the coast, by sweeping in early summer; very local, but not

uncommon where it occurs; Harwich; Essex coast; Sheerness; Southend; Deal; Devonshire coast, on *Umbelliferae*.

HAPLOCNEMUS, Stephens.

This genus contains about seventy species, which are entirely, or almost entirely confined to Europe, the circum-Mediterranean region, and the Atlantic islands; they are characterized by having the tarsal claws furnished with a free membrane, which is appendiculate and as long as the claws; the form is comparatively short and broad, and the upper surface is coarsely punctured and clothed with long upright pilose pubescence; the larvæ live in decaying wood, and the perfect insects may be found in old trees, especially in winter; in summer, however, they may be taken on flowers, &c.; our two species are both rare; they are closely allied, and by some authors have been considered as merely varieties of one species.

- I. Upper surface bronze or bronze-black; punctuation of elytra less coarse *H. IMPRESSUS*, Marsh.
 II. Upper surface greenish-bronze or bluish; punctuation of elytra coarser *H. NIGRICORNIS*, Fab.

H. impressus, Marsh. (*pini*, Redt.). Comparatively short and broad, oblong, convex, clothed with very long brownish pilose pubescence, of a bronze or bronze-black colour; head much narrower than thorax, rather sparingly punctured, antennæ brownish, with second joint lighter, a little longer and more strongly serrate in male than in female; thorax broader than long, with sides rounded, and narrowed towards front, broadest behind middle, not very closely and rather strongly punctured, but much less strongly than elytra; elytra subparallel, very slightly widened behind middle, very coarsely and strongly punctured, with uneven and rather convex shining interstices; legs reddish-yellow, with the femora brownish, and the tibiæ sometimes darker, and the tarsi often fuscous on their upper side. L. 4 mm.

Under bark of elm, oak, pear, &c.; occasionally on flowers or foliage in summer; rare; Forest Hill, Surrey; Copenhagen Fields (formerly); Highgate; Sheerness; New Forest; Glanvilles Wootton; Sutton Park, Birmingham; Staires Farm, near Newnham-on-Severn, Gloucestershire (where I have taken several specimens under bark of old pear trees in January); my wife once found a specimen in my study at Repton, but it had probably come out of old wood from the New Forest; Carlisle (under bark of elms); Scotland, very rare, Forth and Tay districts.

H. nigricornis, F. Rather smaller on an average than the preceding, which it very closely resembles, and chiefly distinguished by its colour, which is dark bluish-green, or greenish-blue, with a bronze reflection; the pubescence is, perhaps, a little paler; the legs are somewhat variable in colour, the tibiæ being either clear yellow or more or less infuscate, and the femora being more or less dark; the punctuation of the elytra is rather coarser and more diffuse than in *H. impressus*, and

in my single specimen the thorax is much more finely punctured, but this does not appear to be always the case. L. $3\frac{1}{2}$ –4 mm.

Found under the same circumstances as the preceding; rare; formerly taken in Hyde Park and Kensington Gardens (S. Stevens); Hastings (Butler); New Forest; Leicestershire, Markfield, &c.; Yorkshire, by beating birches in woods, July (Allen Harker); Ripon (Waterhouse).

PHLÆOPHILINA.

This tribe contains the single genus *Phlæophilus*, the position of which has been considerably disputed; in many respects it bears rather a strong resemblance to *Haplocnemus* and its allies, but differs in the shape of its antennæ, which are moniliform, with the three last joints larger; all the tarsal claws are simple.

PHLÆOPHILUS, Stephens.

One species only belongs to this genus; it is very local, but occurs somewhat commonly under bark in some districts where it is found; it is rather widely distributed in Central Europe, but has not, apparently, been found in the northern portions of the Continent.

P. Edwardsi, Steph. Oblong, rather short and broad, moderately shining, rather scantily clothed with coarse greyish pubescence, head and thorax fuscous, elytra of a dirty testaceous colour with the lateral margins fuscous and with variable wavy dark bands and markings; head rather small, thickly punctured, with the eyes small, but distinct and prominent, antennæ as long as the head and thorax, moniliform, with the last three joints thickened and forming a distinct club; thorax more than double as broad as long, narrowed in front, thickly punctured, with posterior angles blunt; scutellum rather small, transverse; elytra rather broader than thorax, subparallel, slightly wider behind middle, closely and rather strongly punctured; legs testaceous or brownish, more or less infusate. L. $1\frac{3}{4}$ –3 mm.

Under bark and in rotten wood; occasionally by sweeping; rare, but rather widely distributed, and sometimes taken in fair numbers where it occurs; Caterham, Shirley, Weybridge, Esher, Cobham, Barnet, Tonbridge; Mickleham (by beating hedges in autumn); Maidstone; West Grinstead; Portsmouth district; Glanvilles Wootton (holly-bushes, &c.); Leominster; Gumley, Market Harborough, and Sherwood Forest (Rev. A. Matthews, who has taken it in some numbers in the latter locality by beating the old dead boughs on standing trees in October); Cambridge; Derbyshire; Ripon (Waterhouse).

CLERIDÆ.

According to the Munich catalogue, this family contains seventy-five genera and just seven hundred species; this number has, however, been

considerably increased since the time at which the catalogue was published, and the Rev. H. S. Gorham, who has done so much work at the group, informs me that the family now contains about one thousand species; these are of very general distribution, but by far the majority are found in tropical countries; only thirteen genera, represented by fifty species, are found in Europe, of which six genera and only eleven species occur in Britain.

The Cleridæ, taken as a whole, are a very striking family, many of them being exceedingly beautiful both as regards colour and form; the body is elongate, with the thorax narrower than the elytra, and is often strongly pilose; the head is prominent with the eyes very often emarginate, and the antennæ are usually 11-jointed, and are either subfiliform, serrate, pectinate, or distinctly clavate (as in *Corynetes*), in the latter case forming a distinct transition between the Serricorn and Clavicorn groups; in most of the species, however, the terminal joints have a tendency to form a club; the prosternum is short, and the anterior coxal cavities are open behind; the elytra, in nearly all cases, completely cover the abdomen, which is composed of either five or six ventral segments; the legs are more or less elongate, and the tarsi are 5-jointed, the first joint in some genera being covered by the second, and the fourth joint in others being exceedingly small and indistinct; the joints of the tarsi, with the exception of the last, are either altogether or in part furnished with membranous appendages beneath, and the claws are simple or toothed; through their pilose body and lobed tarsi the members of the family bear a close relation to the Melyridæ.

In the perfect state the Cleridæ are found on plants or on the trunks of trees, while a few live in dead animal matter; in the larval state they are carnivorous, and prey upon various larvæ, some of them being found in bees' nests, where they commit great havoc among the grubs; the colour of the larvæ as a rule is bright red or brownish, but some have the upper surface pink, or yellowish-white spotted with pink; their surface is rather thickly covered with hairs; the head is corneous; the antennæ are inserted just above the articulation of the mandibles, and are made up of two short joints; there are five ocelli on each side; the prothorax has an entire scutum, but those of the meso- and metathorax are divided by a longitudinal line; the abdominal segments are fleshy, except the last, which bears a corneous scutum above armed with two projecting points, and a short anal appendage which is used for progression.

Mr. Gorham, in the *Biologia Centrali-Americana*, divides the family into six sub-families, Tillides, Clerides, Phyllobenides, Hydnocerides, Enopliides, and Corynetides; three only of these are represented in our fauna, and it will perhaps be more convenient to regard them as tribes; they may be distinguished as follows:—

- I. Tarsi plainly 5-jointed, with the first joint distinctly visible
from above TILLINA.

- II. Tarsi 5-jointed, but with the first joint covered by the second, and only visible if viewed sideways, and the fourth joint sometimes very small CLERINA.
- III. Tarsi apparently 4-jointed, the fourth joint being very small and obsolete CORYNETINA.

TILLINA.

This tribe is not nearly as extensive as the Clerina, and two genera alone, *Denops* and *Tillus*, are found in Europe, of which the latter only is represented in Britain; the tarsi are plainly 5-jointed, and the antennæ are serrate or pectinate; the eyes are more or less transverse and emarginate in front, and the maxillary palpi have the last joint cylindrical.

TILLUS, Olivier.

This genus contains upwards of thirty species, which are very widely distributed, occurring in North and South America, Africa, Arabia, India, the Philippine Islands, and the Australian region; five species only occur in Europe, of which two are found in Britain; they are found on old timber, and occasionally on flowers.

- I. Elytra entirely black T. ELONGATUS, L.
- II. Elytra black, with base broadly red, and a white fascia on each behind middle T. UNIFASCIATUS, F.

T. elongatus, L. (*ambulans*, F., ♂). Elongate, black, shining, female with the thorax, except anterior margin, bright red, pubescence fine, pilose; head large, finely punctured, antennæ pectinate or strongly serrate, black; thorax longer than broad, cylindrical, very finely and obsoletely punctured, and sometimes transversely rugose, with sides somewhat uneven and a little narrowed behind; elytra broader than thorax, with shoulders well marked, considerably dilated behind in female, parallel-sided in the male, punctured in rather fine rows, interstices broad, finely pilose; legs black. L. 7–8 mm.

The male is a very different-looking insect to the female, as the thorax is black and the elytra parallel-sided; there is often a whitish spot at shoulders and just behind middle of elytra; the antennæ also are more strongly serrate.

In old timber; occasionally on elder blossom; not common; Camberwell, Darenth, Mickleham, Dulwich, Sydenham, Croydon, Tonbridge, Coombe Wood; Devon; Swansea; Hertford; Windsor; Hereford; Repton, Burton-on-Trent (one specimen taken by the late Mr. W. Garneys on his window); Northumberland and Durham district, somewhat doubtful; it is possible that Mr. Garneys' specimen may have been bred from old wood that had come from some other locality, as it has not been recorded from any other neighbouring district.

T. unifasciatus, F. Elongate, parallel-sided, clothed with rather long and thick black pilose pubescence, black with the base of the elytra

broadly red, and a whitish or whitish-yellow fascia on each behind middle, which hardly reaches suture; head large, finely punctured, antennæ black, strongly serrate; thorax longer than broad, strongly narrowed just before base, finely punctured; elytra with rows of coarse and strong punctures, which become obsolete behind middle, apex nearly smooth; legs black. L. 5-6 mm.

In old timber; occasionally found on fresh oak palings; very rare; taken in some small numbers by Mr. S. Stevens in 1879 on fresh oak palings at Biggin Hill, Upper Norwood, and also in the two succeeding years. Hertford and Windsor (Stephens). Mr. S. Stevens' specimens were found in company with *Teretrius picipes* and *Lyctus brunneus*, and most of our collections owe these three species to his liberality.

CLERINA.

The members of this tribe are very numerous; as far as outward appearance goes they bear a somewhat close resemblance to the Tillina, but are distinguished by having the first joint of the tarsi covered by the second, and only visible if viewed sideways; the antennæ are more feebly serrate, and the last joints have a greater tendency to form a club; the eyes are emarginate in front; the palpi are variable in shape; five European genera belong to the tribe, of which three are usually recognized as British, and a fourth, *Trichodes*, has certainly occurred in Britain on several occasions, and seems to have almost, if not quite, as good a claim to admission as indigenous as *Tarsostenus*; as, however, Mr. Gorham is of opinion that the two species which have been found in Britain (*T. alvearius* and *T. apiarius*) are strictly Alpine insects, I have only included them doubtfully; there seems to be very little generic difference between *Opilo* and *Tarsostenus*, and as regards the distinctions usually given there seems to be some contradiction among different authors.

- I. Antennæ rather gradually thickened towards apex with a loose and not abrupt club.
 - i. Last joint of maxillary and labial palpi more or less strongly securiform.
 - 1. Eyes more strongly granulate and more prominent; first joint of tarsi very short, second to fourth joints with emarginate soles *OPILO, Latr.**
 - 2. Eyes less strongly granulate and less prominent; first joint of tarsi rather more distinct, second to fourth joints with very short, almost entire soles *TARSOSTENUS, Spin.**
 - ii. Last joint of maxillary palpi slender and not securiform *THANASIMUS, Latr.*

* I can see no satisfactory characters on which to separate these genera; the characters derived from the eyes are very unsatisfactory, and in some points the different species of the two genera appear to differ *inter se*; in our single species of *Opilo*, for instance, the maxillary palpi have the last joint dilated and hatchet-shaped, whereas Dr. Horn separates the American species of *Opilo* from *Tarsostenus*, on the ground that the "last joint of the labial palpi alone is dilated."

- II. Antennæ with a distinct and abrupt short club; last joint of maxillary palpi a little broader than the preceding, of labial palpi securiform (TRICHODES, *Herbst.*)

OPILO, Latreille.

The species belonging to this genus are about forty in number, and are very widely distributed, especially in the tropics; four are found in Europe, of which one only occurs in Britain; its larva has been fully described and figured by Waterhouse (Trans. Ent. Soc. Lond., No. 1, pl. 5, fig. 1), and is also figured by Westwood (Classification, i. p. 262, fig. 29, 12); it is of a pink colour above and pale beneath, and about half an inch long, slightly narrowed in front and widened behind, with the abdomen terminating in two corneous prominences; the body is covered with rufescent hairs; according to Chapuis and Candèze the meso- and metathorax and the six first abdominal segments bear four spots of a bright red colour on each; these larvæ, according to Westwood, are found in rotten white-thorn wood, and also in dry and decaying willows, where they feed on the larvæ of *Anobium* and other insects; the perfect insects are found under the bark; Latreille states that the larvæ are also met with in houses in old wood.

O. mollis, L. Elongate, rather depressed, with the elytra slightly widened behind in the male and more plainly in the female, clothed with long pale pilose hairs; colour fuscous with an oblique spot at shoulders of elytra (which is often divided, forming a spot at shoulder and a longitudinal spot near suture between base and middle), a fascia on each behind middle not reaching suture, and the apex, yellow; the head and thorax are testaceous in front, and are closely and coarsely sculptured; head large, with eyes strongly granulated, antennæ long, testaceous; thorax longer than broad, contracted behind, with a tubercle on each side in front; elytra long, with rows of strong punctures, interstices with rows of distinct but small punctures; legs testaceous, with femora broadly ringed with a more or less pronounced pitchy colour, apex and base light. L. $7\frac{1}{2}$ –10 mm.

In rotten wood and by beating dead hedges; occasionally at sugar; very local, and, as a rule, rare; Kew, Richmond Park, Putney, Coombe Wood, Forest Hill, Darenth Wood, Chatham, Sheerness, Whitstable, Leytonstone, Brockley, Croydon, Beckenham, Loughton, Barnes, Esher, Tonbridge; Windsor; Hastings; Llangollen; it appears to be chiefly confined to the London district, in which it is generally distributed, and sometimes not uncommon; it is so conspicuous an insect that it can hardly have been passed over in other localities.

TARSOSTENUS, Spinola.

In the Munich catalogue only three species are referred to as belonging to this genus, but the number has since been largely added to, and Mr. Gorham informs me that it is of almost universal distribu-

tion; one species alone, however, is found in Europe; it appears chiefly to differ from *Opilo* in the finer granulation of the eyes, and the formation of the tarsi, but is hardly distinct from this genus.

T. univittatus, Rossi (*Opilus fasciatus*, Steph.). Elongate, black or fuscous black, villose, shining, with a transverse whitish or whitish-yellow fascia on each elytron not reaching suture; antennæ ferruginous, fuscous towards apex; head thickly punctured; thorax longer than broad, narrower than elytra, coarsely and sparingly punctured, but smooth on central line which is more or less furrowed; scutellum finely punctured; elytra long, very coarsely punctured, with the punctures almost confluent in places; legs ferruginous with the base of the femora black. L. 5-6 mm.

On flowers, &c.; very rare; two specimens were recorded by Stephens and Curtis as taken by Mr. Shillingford in the woods near Winchmore Hill, Kent, and it has occurred much more recently on the Cotswold Hills, Gloucestershire; it seems, however, to be a question whether it can really be considered to be truly indigenous.

THANASIMUS, Latreille. (*Clerus*, auct.; *Cleroides*, Schäffer.)

There appears to be at present considerable confusion as to the nomenclature of the genus *Clerus*; in the catalogue of Heyden, Reitter, and Weise the name is applied to *Trichodes*, Herbst.; while *Cleroides*, Schäffer, includes *Pseudoclerus*, Duv., *Pseudoclerops*, Duv., *Thanasimus*, Latr. (containing two species, *T. formicarius* and *T. rufipes*), and *Allonyx*, Duv. Curtis and Stephens both include *T. formicarius* under *Thanasimus* rather than under *Clerus*, but in all our modern catalogues it has been referred to the latter genus; there appears to be but little real difference between the two genera, and by some authors (e.g. Kiesenwetter, *Naturgesichte der Insect. Deutsch.* iv. p. 683) they appear to be regarded as synonymous; in *Clerus*, however, the posterior tarsi are rather broadly dilated, whereas in *Thanasimus* they are slender and longer; they are rather extensive genera, and of almost universal distribution in warm and tropical countries; the larva of *T. formicarius* is described by Ratzeburg, *Forst. Insecten*, pl. i. f. 17), and, together with the pupa, is figured by Westwood (*Classification*, i. p. 262, fig. 29, 15); it is of a dark pink colour, with a pitchy head and prothorax, and two pitchy spots on the meso- and metathorax; it feeds on wood-feeding larvæ; the pupa, like the larva, is hairy, and is terminated at apex by two comparatively long cerci.

T. formicarius, L. (*Clerus formicarius*, auct.). Elongate, depressed, anterior parts clothed with long pilose hairs; head large, black, coarsely punctured, eyes finely granulate, antennæ black, last joint with the apex ferruginous; thorax about as long as broad, red, with the anterior portion (which is divided by a broad V-shaped furrow from the posterior portion) black, coarsely punctured, posterior

angles rounded; elytra depressed, parallel-sided, black with the base red, strongly punctured in front, finely behind, with two strong bands of thick white pubescence, one before middle, very irregular, and the other behind middle; legs black, with the tarsi more or less ferruginous. L. $6\frac{1}{2}$ –9 mm.

Under bark of felled trees, especially fir; in rotten wood, &c.; local; London district, Kent, and Surrey, not uncommon, Camberwell, Shirley, Esher, Woking, Coombe Wood, Richmond Park, Ripley, Maidstone, Sheerness, Bearsted; Deal; Walmer Forest; Dover; Hastings; Glanvilles Wootton; Windsor; Cambridge; Scarborough; Northumberland and Durham district; Scotland, Highlands, on logs of Scotch fir, Forth, Tay, Dee, and Moray districts; Ireland, near Dublin.

(**TRICHODES**, Herbst.)

This genus contains a considerable number of species, which are widely distributed, but which appear to be more characteristic of temperate climates than the other members of the family; no less than seventeen species are found in Europe, a number exceeding all the other European members of the Clerina and Tillina taken together; the genus is widely distributed in North America, and is represented in Siberia; the species are in most cases very handsome, brightly coloured and conspicuous insects, and may be known by their strong, compact and abrupt club, and by the formation of the palpi; some of them appear to be very variable.

The perfect insects are usually found on flowers, but the larvæ are exceedingly destructive to bees and wasps of various species; that of *T. alvearius* is described and figured by Westwood (Classification, i. p. 262, fig. 29, 9); these larvæ appear to be rather broader and plumper than those belonging to some of the other Cleridæ, and rather broader in front; otherwise they do not differ materially from them; they are of a beautiful red colour, and are spoken of by Swammerdam, who first described their habits, as “red worms;” the females manage to lay their eggs in the bees’ cells, and the larva first devours the grub in the cell in which it is hatched, and then proceeds from cell to cell devouring the inhabitant of each until it comes to maturity; it then forms a small cocoon in which it changes to a pupa, and when it emerges as a perfect insect it is enabled to escape, as it is too hard to be affected by the stings of the bees.

- I. Elytra orange-red with three cyaneous fasciæ, apex orange-red *T. ALVEARIUS*, F.
- II. Elytra orange-red with two fasciæ and the apex cyaneous *T. APIARIUS*, L.

(**T. alvearius**, F. Elongate, depressed, very hairy, upper surface rather dull, under-side more shiny, very thickly pubescent; head and thorax greenish-blue, deeply and closely punctured, eyes finely granulate, antennæ pitchy or pitchy-ferruginous or bluish-black; elytra orange-red, with a spot at scutellum, a transverse fascia, usually united

to the same, a little before middle, a broader fascia behind middle, and a third before apex (not reaching sides), purplish-blue; upper surface depressed, distinctly but not strongly punctured, with a plain intermixture of smaller punctures; legs metallic, bluish or greenish, very hairy. L. 10–16 mm.

On flowers, Umbelliferæ, &c.; doubtfully indigenous; Manchester; Dorking, one specimen taken in June (Waterhouse); there is a specimen in Dr. Power's collection, without locality, taken by Mr. Buxton; these specimens are probably importations, as they might easily be imported in the larval state in foreign bee-hives.

(***T. apiarius***, L. Very like the preceding, but it may easily be distinguished by having two fasciæ on the elytra and the apex purplish-blue, whereas in *T. alvearius* there are three cyaneous fasciæ and the apex is orange-red; the head and thorax are more finely punctured, and the elytra are a little more shiny and less pubescent. L. 10–16 mm.

On flowers; Coombe Wood, near Dover; Norfolk; Manchester; New Forest; if these specimens are authentic, the same remarks probably apply to them as to the preceding; the insects were not considered indigenous by the old authors Marsham and Samouelle.

CORYNETINA.

This tribe contains a few genera, of which the most important are *Necrobia* and *Corynetes*; they are small, brightly coloured insects with strongly clavate antennæ, and with the apical joint of all the palpi not or comparatively slightly enlarged; in both the perfect and the larval state they are found in carcasses, old bones, skins and other animal matter, on which they feed; the larvæ do not appear to differ materially in structure from those of the preceding tribes; four genera occur in Europe, of which two are found in Britain.

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| I. Club of antennæ compact, with the penultimate joints strongly transverse; eyes glabrous | NECROBIA, Latr. |
| II. Club of antennæ loose, with the penultimate joints not, or hardly, transverse; eyes hairy | CORYNETES, Herbst. |

NECROBIA, Latreille.

About a dozen species are contained in this genus, three of which are found in Europe, and the remainder occur in Africa, India, Ceylon, the Australian region, &c.; through their compact round club they afford the strongest approach to the Clavicornia. No notice of this genus is complete without a reference to the fact that one of the species, *N. ruficollis*, saved the life of the celebrated Latreille: when imprisoned at Bordeaux during the French Revolution, he found a specimen of the insect on the walls of his cell, and sent it to M. Bory de St. Vincent, whom he knew to be interested in Entomology, and who had influence enough to secure his release; as he himself says, "Renfermé dans un

bouchon de liege cacheté, et envoyé à Bory de Saint Vincent, cet insecte devint l'occasion de ma délivrance."

- I. Thorax and base of elytra red *N. RUFICOLLIS*, *F.*
 II. Thorax and elytra dark blue.
 i. Legs black *N. VIOLACEA*, *L.*
 ii. Legs red *N. RUFIPES*, *De G.*

***N. ruficollis*, F.** Oblong, shining, clothed with long villose pubescence; head bluish-black, antennæ black with base reddish, thorax and base of elytra and legs bright red, elytra, except base, cyaneous, abdomen black; head and thorax finely punctured, the former rather large, with eyes prominent; the latter almost as long as broad, with sides rounded, posterior angles obtuse; elytra depressed, considerably broader than thorax, slightly widened behind, with very fine punctured striæ, interstices very broad, regularly and finely, but distinctly, punctured. L. $4\frac{1}{2}$ –5 mm.

In dry carcasses, skins, &c., and about old bones; locally common, and sometimes very abundant; London district, common; Broadstairs; Dover; Lowestoft; Hastings; Weymouth; Devon; Bristol; Swansea; Smallheath, near Birmingham; Repton; Sherwood Forest; Manchester; Northumberland and Durham district; Scotland, rare, Solway and Forth districts; Ireland, near Belfast.

***N. violacea*, L.** Smaller than the preceding, entirely cyaneous, with the antennæ and legs black; it may also be distinguished both from this and the following species by the strong rows of punctures on the elytra, which become feebler towards apex; the interstices are narrow, and are very finely punctured; the upper surface is rather sparingly clothed with blackish villose pubescence; the elytra are rather more convex than in *N. ruficollis*, and are somewhat uneven. L. $3\frac{1}{2}$ –4 mm.

In dead animals, dry skins, &c., and often on flowers; local, and not so common as the preceding; London district, rather common; Hastings; Brighton; New Forest; Glanvilles Wootton; Swansea; Bewdley; Knowle; Repton; Manchester; Northumberland and Durham district; Scotland, local, Solway, Tay, Dee, and Moray districts; Ireland, near Dublin.

***N. rufipes*, De G. (*Agonolia rufipes*, Muls.).** Very like the preceding, but easily distinguished by the entirely red legs and red base of antennæ, and also by the much finer punctuation of the elytra, which rather resembles that of *N. ruficollis*, but is somewhat stronger; the thorax is more transverse than in *N. violacea*, and the elytra more even; the pubescence on the elytra is shorter and on the thorax longer, the difference being rather more marked than in either of the other two species. L. $3\frac{1}{2}$ –4 mm.

In carcasses; about old bones, &c.; local; London district, rather common; Weymouth; Devon; Sherwood; Scarborough; Manchester district; Northumberland and Durham district; Scotland, Tweed and Solway districts; Ireland, Belfast, Larne, &c.

CORYNETES, Herbst.

This genus is easily distinguished from the preceding by the loose club of the antennæ, of which the penultimate joints are not, or scarcely, transverse, and also by the broader apex of the last joint of the palpi; it contains about twenty species, which occur in South America, South Africa, the Canary Islands, &c.; four are found in Europe, of which one only is indigenous to Britain.

C. cœruleus, De G. This species bears a very close superficial resemblance to *Necrobia violacea*, but may easily be distinguished by the shape of the club of the antennæ, longer thorax, and less distinctly and regularly punctured elytra; it is entirely cyaneous, clothed with black villose pubescence, with the antennæ and legs black; head and thorax sparingly punctured, the latter longer than broad, with the sides rounded and the posterior angles right angles, projecting; elytra very shining, with somewhat irregular and more or less obsolete rows of larger punctures towards base, almost smooth at apex, and with two raised prominences near scutellum, behind which is a depression; legs moderately long. L. 3–4 mm.

About old bones; in carcasses, &c.; local, but occasionally common; London district, generally distributed; Hastings; Glanvilles Wootton; Bewdley; Church Stretton; Hertfordshire; Repton; Manchester (in drysalts' warehouses); the species appears to be sometimes parasitic on *Anobium*.

The species varies considerably in size and punctuation. I have before me a male and female from Dr. Power's collection, the former of which is much smaller than the latter, and has the elytra much more strongly and distinctly punctured, and the thorax plainly æneous.

DRILIDÆ.

This family is small in numbers, and but little understood; the difference in the sexes is more striking even than in *Lampyrus*, the female being enormously large in proportion to the male; as far as is known the former sex is always apterous, but this may not be the case universally; the antennæ are usually very strongly pectinate in the males; the palpi are often very extraordinary in their structure, and for this reason Mr. Gorham would place the family provisionally near the *Limexylonidæ*; as a rule they have been placed in close proximity to the *Lycidæ* and *Lampyridæ*.

DRILUS, Olivier.

This genus contains rather more than a dozen species, of which the majority are found in the European region and North Africa; one, however, has been described from Natal; the females are apterous and very

large in proportion to the males. The larva of the female *Drilus flavescens* is large and broad, 16 to 18 mm. in length and 8 to 10 mm. in breadth, with short 2-jointed antennæ; the body is composed of twelve segments, of which the three first bear the legs, and the remainder, except the last, are furnished on the under surface with two conical fleshy tubercles, and on the upper with fascicules of hairs; the last segment is bifurcate, and furnished with a tuft of hair on each side; the larva is very voracious, and feeds on molluscs, especially *Helix nemoralis*; it remains in the larval state all the winter, and then transforms itself into a pupa, in which state it remains about twenty days; to the imago that came forth from this pupa Desmarest gave the name of *Cochleoctonus vorax*, but he afterwards succeeded in rearing the male from larvæ of the same character, as well as in taking the sexes in copulâ; a full account of these facts will be found in Westwood's Classification, i. p. 253.

D. flavescens, Rossi. Male black with the elytra luteous, clothed with long and coarse yellowish pubescence; head rather large, about as broad as thorax, deeply impressed between eyes, thickly punctured; antennæ fuscous black, strongly pectinate, or even somewhat flabellate from the fourth joint inclusive, second joint small; thorax transverse, shining, uneven, rather strongly and closely punctured at base and posterior angles, which are raised; scutellum black; elytra comparatively short and broad, with fine and indistinct rugose punctuation and traces of striæ; under-side finely punctured, sparingly pubescent; legs fuscous, with tarsi lighter. L. 5-6 mm.

Female larviform, apterous, fleshy, of a fulvous colour, hairy, composed of twelve segments, of which the last is terminated by two hairy processes and a cylindrical appendage; the antennæ are very short, filiform, and 10-jointed, and the legs moderately long, with short tarsi; the body is narrowed in front and widened behind. L. 18 mm.

The male is found locally in chalky districts in open places on grasses or low shrubs, and is sometimes not uncommon where it occurs; it appears, however, to be limited to the London, south-western, and southern counties; Caterham, Darenth Wood, Ashford, Gravesend, Chatham; Dover; Folkestone; Portsmouth district; Winchester; Isle of Wight. The female occurs under stones, fallen leaves, or in snail shells, and is extremely rare; it has been taken on the Sussex Downs and at Folkestone.

In Dr. Power's collection there is a specimen referred to the female of this insect labelled "West Cliff, Sandgate Road, Folkestone, Sept. '72. W. P. W.;" it may be, and apparently is, much shrunk, but is entirely different in shape to the figure given by Westwood (Classification, i. 247, fig. 26, 13), being almost balloon-shaped, very wide and round in front, and much narrowed behind; in other respects it agrees with the description.

In De Marseul's "Nouvelles et faits divers," No. 14, May 1870

(referred to by Mr. Rye, Ent. Monthly Mag. vii. 59), it is stated that the female of *Drilus flavescens* is not only found in *Helix nemoralis*, but in several other species as well, and that a good way to take specimens is to collect in February and March all the snails found in gardens, and to make with a penknife an opening at the extremity of the first spiral turn of the shell, opposite the mouth; if fragments stuck together in a kind of spider's web be then seen, there is no doubt of the presence of the insect.

LIMEXYLONIDÆ.

This family contains four genera, of which two are represented in Europe; with the exception of *Micromalthus*, a North American genus, they may at once be known by the very large flabellate maxillary palpi of the male, which give the insect a very peculiar appearance; the antennæ are 11-jointed, and are inserted at the sides of the head, which is narrowed behind; they are either serrate or subfiliform; the anterior coxal cavities are open behind, and all the coxæ are contiguous; in our genera the elytra entirely, or almost entirely, cover the abdomen, which latter consists of five or six free ventral segments; the legs are slender and moderately long, and the tarsi are 5-jointed and very elongate; in the exotic genus *Atractocerus* the elytra are much abbreviated.

The larvæ of *Limexylon* and *Hylecætus* are figured by Westwood (Classification, vol. i. p. 269, fig. 30, 19, 23); they are rather peculiar in their appearance, the prothoracic segment being much enlarged and dilated into a hood-like process, which is larger in the latter than in the former genus; in *Hylecætus* the last segment is large and considerably reflexed, and bears a long upright horn-like process, which is furnished with setæ on sides and apex; in the larva of *Limexylon* the last segment is produced into a large half-upright obtuse lobe, and the hood-like process of the prothoracic segment, as above mentioned, is smaller.

The position of the family has been considerably disputed; many authors have placed it near the Bostrichidæ, but it is now apparently considered as coming close to the Cleridæ, and in the catalogue of Heyden, Reitter, and Weise it is placed as a tribe of that family; in several exotic species of Drilidæ the palpi are very extraordinary, and on this account the Limexylonidæ and Drilidæ would seem to be related, and the best position for the former family appears to be between the Drilidæ and the Cleridæ.

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| I. Antennæ shorter, feebly serrate in male, strongly serrate in female; scutellum with a raised carina in front. . . . | HYLECÆTUS, Latr. |
| II. Antennæ longer, subfiliform in male, very feebly serrate in female; scutellum without raised carina | LIMEXYLON, F. |

HYLECÆTUS, Latreille. (*Elateroides*, Schäffer.)

This genus contains about a dozen species, of which two are found in Europe, and the remainder in North and South America, Java, and the

Gaboon region; they are elongate subcylindrical insects, with the palpi of the male very strongly flabellate, and the antennæ of the female strongly serrate or pectinate; the abdomen is composed of six (according to some authors seven) ventral segments, and the tarsi are elongate, longer than the tibiæ, which latter, with the exception of the anterior pair, are armed with a sharp tooth or spine at apex; our single species is found in oak, fir, and birch, and varies very much in size; Mr. Matthews has observed that out of a large number taken from one tree, those which were found in the trunk or larger branches were very much larger than those found higher up the tree in the smaller branches or twigs, these latter appearing to have adapted themselves to a scantier diet, and so to have become depauperized.

H. dermestoides, L. (♂ *proboscideus*, F.). Elongate, subcylindrical, clothed with yellowish pubescence; head large, coarsely punctured, eyes moderately prominent, antennæ feebly serrate in male, strongly serrate or pectinate in female; thorax transverse, coarsely and not closely punctured, with traces of a central furrow or depression, posterior angles obtuse; scutellum quadrangular, with a raised keel in front; elytra very finely and closely sculptured, with more or less distinct traces of raised lines; legs slender. L. 6–15 mm.

Male shorter and narrower, black, with the elytra testaceous, more or less black towards apex, sometimes entirely black; legs testaceous, sometimes slightly infusate, maxillary palpi strongly flabellate.

Female longer and broader, with the thorax more transverse and more rounded at sides, entirely testaceous or reddish-testaceous with the eyes and breast black; maxillary palpi not flabellate, antennæ strongly serrate.

In oak, fir, and birch; very local; Sherwood Forest, locally common; Cannock Chase; Stretford, near Manchester; Scotland, Highlands, rare, in stumps of Scotch fir; Tay district.

LIMEXYLON, Fabricius.

This genus in many respects resembles the preceding, especially as regards the flabellate maxillary palpi of the male, but the males and females differ much less than in *Hylecætus*, and both sexes have the antennæ subfiliform and considerably longer; the thorax, moreover, is longer than broad, and the abdomen has one ventral segment less; the scutellum has no carina in front; the anterior tarsi, also, are considerably shorter, being plainly shorter than the tibiæ; the genus contains three species, one from Europe, one from North America, and a third from Tasmania.

L. navale appears to be very common in oak forests in the north of Europe, and is said to do considerable damage in the dockyards of Sweden; Linné, we are told, was commissioned by the King of Sweden to inquire into the question of the injury done by this insect to ship

timber, and recommended that the wood should be sunk under water at the time when the perfect insect made its appearance, by which means it was secured against further attacks.

L. navale, L. Elongate, subcylindrical, clothed with short silky pubescence; head large, very closely and finely rugose, very strongly contracted at base; thorax longer than broad, subcylindrical, not margined, narrowed in front, closely punctured, with traces of a central furrow, especially at base; scutellum rather long, oblong; elytra long, very finely sculptured, with traces of raised lines; legs long and slender. L. $4\frac{1}{2}$ –10 mm.

Male black, with the front part of thorax and the posterior angles of the same, and the base and a sutural band on elytra, as well as the legs and abdomen, yellow or reddish-yellow; maxillary palpi flabellate.

Female yellow or reddish-yellow, with the sides and apex of elytra black; maxillary palpi simple.

In both living and dead oak; found by Mr. J. Chappell in all stages in Dunham Park, Manchester; Stretford, Manchester, and Bowdon, Cheshire (Reston); Windsor Forest (Stephens and Bowring); Portsmouth (Power).

PTINIDÆ.

The name Bruchidæ is now given by several continental authors to this family, on the ground that the *Bruchus* of Geoffroy has the priority of the *Ptinus* of Linné; as, however, the name of Ptinidæ has been so long applied to the family, and the name of Bruchidæ has been also so long used to denominate another well-known family, it seems a very great pity to cause the confusion that must necessarily result from the change of nomenclature.

The family comprises about sixty genera and four hundred species; some of the genera have, however, been subdivided into several further genera by different authors, especially Mulsant, Kiesenwetter, and Reitter; the species are widely distributed over the surface of the world, and are small, oblong, round or oval insects, which, in many cases, are exceedingly destructive; they are characterized by having the antennæ long and filiform, or very faintly serrate and inserted upon the front, as a rule, 11-jointed; the thorax is narrower than the elytra, and usually constricted at base; the elytra are, as a rule, more or less rounded, and sometimes globular, and completely cover the abdomen; the legs are long and not retractile, with the femora usually clavate at apex; the tarsi are 5-jointed, with the first joint not shorter than the second; the abdomen is composed of five ventral segments, of which the first is not elongate.

The larvæ of the Ptinidæ do not call for any particular remark; they are small fleshy grubs, which have the body bent in a semicircular position, a character that causes them to bear a somewhat strong analogy to the larvæ of the Lamellicornia; there are no ocelli, and the antennæ are short and inserted immediately above the

mandibles; the thoracic segments resemble those of the abdomen, which latter is made up of nine segments, the last of which is simple, and is not furnished with cerci or projections.

The British genera belonging to the family may be divided as follows:—

- I. Elytra punctured and pubescent.
 - i. Antennæ contiguous or almost contiguous at base; tarsi with the fifth joint longer and narrower; elytra striated.
 - 1. Scutellum distinct; tarsi with the fifth joint a little longer than second PTINUS, L.
 - 2. Scutellum not distinct; tarsi with the fifth joint much longer than second NIPTUS, Boield.
 - ii. Antennæ more distant at base; tarsi with the fifth joint very short and broad; elytra not striated HEDOBIA, Sturm.
- II. Elytra smooth and glabrous, much inflated.
 - i. Thorax strongly pubescent MEZIUM, Curt.
 - ii. Thorax glabrous GIBBIUM, Scop.

PTINUS, Linné. (*Bruchus*, Geoffroy.)

This genus contains upwards of a hundred species, which are very widely distributed throughout the world, species occurring in Ceylon, New Zealand, Siberia, Kamtschatka, Brazil, Peru, Tahiti, &c.; some of the species have been rendered almost cosmopolitan through being transported in articles of commerce; *P. fur* is often very injurious to Natural History collections; it is said also to feed upon old woollen clothes, and occasionally to do great damage to wheat deposited in granaries; about fifty species are found in Europe, of which six have usually been included in the British lists; one or two others, however, have been found in Britain, but they have probably been imported; I have also placed *P. latro* in the doubtful category, as very little appears to be known about it.

- I. Tarsi with the fourth joint bilobed, broader than third; elytra oblong in both sexes P. GERMANUS, F.
- II. Tarsi with the fourth joint not or scarcely bilobed, narrower than the third joint.
 - i. Elytra oblong, with shoulders well marked in both sexes. P. SEXPUNCTATUS, Panz.
 - ii. Elytra, at least in female, considerably rounded at sides.
 - 1. Thorax with central furrow indistinct. P. LICHENUM, Marsh.
 - 2. Thorax with central furrow broadly and strongly marked behind.
 - A. Elytra less coarsely punctured, with setæ shorter P. FUR, L.
 - B. Elytra more coarsely punctured, with setæ longer P. SUBPILOSUS, Müll.

P. germanus, F. (*palliatus*, Perris; *rufipes*, Steph. Ill.). Of a pitchy-brown colour, irregularly sprinkled with more or less distinct patches of white pubescence, and with the shoulders of the elytra lighter; head rather large, with the eyes prominent, antennæ very

long and rather slender, reddish; thorax coarsely and rugosely punctured, with a transverse row of tubercles (which are sometimes not very plain) before middle, and constricted behind middle; scutellum large; elytra oblong in both sexes, very much broader than thorax, and longer in proportion than in any of the other species, rather strongly punctured in distinct rows, with strongly marked shoulders; legs reddish, moderately long, and rather slender. L. $3\frac{1}{2}$ –5 mm.

In old posts, &c.; rare; Cobham, Surrey (Stephens); Richmond Park (Lewis); Purfleet (Rye); Orpington (Power); Norfolk, Suffolk, Devon; Swansea; Northumberland and Durham district, very rare, Newcastle and Twizell.

P. sexpunctatus, *Panz.* Of a black or pitchy-black colour, with the forehead and scutellum clothed with white pubescence, and with a spot of white pubescence behind shoulders of elytra, and another (usually double) on each behind middle; the elytra are oblong, and have the shoulders well marked in both sexes; head, with eyes, as broad as thorax; antennæ long and rather robust; thorax longer than broad, granulose, strongly constricted and depressed behind middle; scutellum distinct; elytra subparallel, punctured in somewhat irregular rows, interstices furnished with rows of fine setæ; legs reddish, rather stout, with the first joint of the posterior tarsi fully as long as the two following; under-side clothed with short thick whitish pubescence. L. 3–4 mm.

In old wood; occasionally found in houses; not common; Putney, Richmond Park, Forest Hill, Blackheath; Glanvilles Wootton and Farley, Dorset; Exeter (in houses; also said to have been taken in a humble-bee's nest in some numbers); Repton, Burton-on-Trent; Carlisle; Scotland, Edinburgh.

P. lichenum, *Marsh.* (s.g. *Pseudoptinus*, *Reitt.*). Of a dark fuscous or blackish colour, sometimes with a very slight subæneous reflection, with the thorax convex, and furnished with only a very fine central furrow, and clothed with spots of white scaly pubescence, which are not very apparent except in fresh specimens; the elytra are marked with rather distinct wavy bands of whitish pubescence; the sexes are very different in appearance. L. 2–3 mm.

Male cylindrical, with the elytra oblong, and with the shoulders well marked, antennæ very long, brownish, usually darker at base and lighter at apex; eyes rather large; thorax longer than broad, constricted at base, rather roughly sculptured; elytra with punctured striæ; legs moderately long, ferruginous.

Female with the elytra oval, subglobose, the eyes smaller, and the antennæ much shorter; the thorax is only as broad as long, and the sculpture of the elytra is a little finer.

On old palings, &c.; very local, but occasionally common where it occurs; Mickleham, Camberwell, Wandsworth, Cobham, Box Hill, Highgate, Croydon; Drayton, Norfolk; Windsor; Glanvilles Wootton; Scotland, very rare, "Raehills," Solway district, Murray's Cat.

P. fur, L. Of a lighter or darker fuscous-brown colour, with pale pubescence; thorax subcylindrical, with a distinct central furrow, which is furnished on each side with a longitudinal patch of yellowish-grey hairs, which are abbreviated in front, and join or nearly join behind; these patches are often rubbed, except in fresh specimens, as also, in fact, is the pubescence of the elytra, which is sometimes very indistinct; the scutellum is clothed with whitish pubescence, and there are two bands or patches of the same on the elytra; the elytra are punctured in regular rows, and bear rows of short setæ. L. 2-4 mm.

Male with the antennæ very long, and the third joint twice as long as the second, and the eyes large and convex; the elytra are oblong and parallel-sided, with the shoulders marked, and the rows of punctures are rather strong, the interstices being narrow; the legs are very long and slender, and the apex of the femora is elongate-clavate.

Female with the antennæ much shorter, and the eyes smaller; the elytra are ovate, subglobose, and are more finely punctured, with much broader interstices; the legs also are shorter and stouter, with the apex of the femora scarcely clavate.

In old wood; often found in old houses and museums; occasionally it occurs in birds' nests, and in various kinds of decaying animal and vegetable refuse; common and generally distributed throughout the greater part of the kingdom.

P. subpilosus, Müll. This species appears closely to resemble *P. fur*, but it is smaller and narrower, and, as a rule, more lightly coloured; it may be known by the much longer setæ and coarser punctuation of the elytra, and the absence of the white tuft of hairs that fringes the base of the longitudinal central furrow of thorax; the latter distinction, however, is not very obvious; the sexual differences seem to be much the same as in *P. fur*. L. 2-2½ mm.

In rotten wood, sometimes in company with ants; rare; Chatham (J. J. Walker); Tilgate Forest, in ants' nests (Brewer); Boundstone (Power); Cobham Park, Surrey; Repton (W. Garneys).

The three following species have been taken in Britain, but can hardly be accepted as indigenous without further confirmation:—

(*P. pilosus*, Müll. Very closely allied to *P. subpilosus*, and difficult to distinguish from that species; it is, however, a little larger, and may be distinguished by its broader and somewhat more granulosely sculptured thorax and stouter antennæ, of which the first joints are proportionally shorter; the elytra in the female are rather longer and less globose, with the punctures in the striæ smaller and more closely set, and the third joint of the tarsi is somewhat longer. L. 2½-3 mm.

In old wood; Horsell and Enfield (Power); it is also said to have been taken at Chatham and Tilgate, but it has in some instances been apparently confused with *P. subpilosus*; it is generally distributed and not rare in Germany, especially in old oaks.

(*P. brunneus*, Duft. (*testaceus*, Boield.; *hirtellus*, Sturm). Of a tes-

taceous or brownish-red or dark brown colour, with the thorax roughly sculptured, and furnished with tufts of yellowish hair on disc; the thorax is as long as broad in the male, and broader than long in the female, and has the central furrow distinct; elytra with moderately strongly punctured striæ, and rows of rather long setæ, and more or less thickly clothed at base with yellowish-grey pubescence; there are, however, no whitish patches on the elytra as in *P. fur*, and the antennæ in the male are shorter than in that species; the setæ on the elytra are also considerably longer; the elytra in the male are elongate, and in the female subglobose, as in the allied species; superficially the insect much resembles *P. fur*. L. 3 mm.

In old wood, &c., especially in warehouses; probably imported; Bermondsey, Surrey; Birdbrook and Mickleham (Power); Smallheath and Knowle, near Birmingham (Blatch).

(*P. latro*, *F.* Closely allied to the preceding, but distinguished by its longer and narrower form and longer thorax, the absence of the yellowish-grey pubescence at the base of the elytra, and the shorter rows of setæ on the interstices; it is apparently, as a rule, of a lighter colour, and rather larger. L. 3-4 mm.

In old houses, especially in store-rooms; two examples in Mr. Waterhouse's collection, one from old collection with no history, and the other labelled "Scotland, Turner;" on the authority of these specimens Mr. Waterhouse apparently introduced the species into his catalogue; there is, however, nothing further known of the insect as British.

NIPTUS, Boieldieu.

This genus contains about a dozen species, of which nearly all occur in Europe; one, however, has been described from North America, and one from Algeria; they are distinguished by having the scutellum indistinct, and the fifth joint of the tarsi much longer than the second; the eyes are very small; the elytra are more or less globular, and more or less distinctly striated; the femora are clavate at apex; some authors divide the genus into several distinct genera, but they hardly seem worthy of generic rank.

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| I. Elytra obsoletely striate | N. HOLOLEUCUS, <i>Fald.</i> |
| II. Elytra strongly crenate-striate | N. CRENATUS, <i>F.</i> |

N. hololeucus, *Fald.* Of a pitchy colour, but entirely clothed with thick recumbent silky golden or brownish-golden pubescence, and furnished besides with fine outstanding setæ, which are arranged in rows on the elytra; eyes very small; antennæ long and rather slender; thorax much narrower than elytra, very convex, with the sides rounded, constricted at base; scutellum indistinct; elytra globose, narrowed at base; legs long, femora rather strongly clavate at apex; tarsi moderately long. L. 3-4 mm.

In old houses, especially in cupboards; it is also found in seeds, &c.; generally distributed and common throughout the greater part of the kingdom; many years

ago this insect used to be somewhat of a rarity, and was confined to towns, but it has gradually spread and established itself even in the remotest country villages.

N. crenatus, F. (*minutus*, Ill. ; *Tipnus crenatus*, Thoms.). Of a dark brown colour, moderately thickly clothed with greyish pubescence; antennæ rather short; thorax as long as broad, roundish quadrangular, with a more or less distinct longitudinal central furrow; scutellum indistinct; elytra much broader than thorax, strongly convex, narrowed to base, with strongly crenate striæ, interstices slightly elevated; legs rather short, with the femora scarcely clavate at apex, tarsi short. L. 2-3 mm.

In old wood, &c. ; occasionally found in birds' nests and about houses; local, and as a rule not common; London; Suffolk; Glanvilles Wootton; Devon; Swansea; Birmingham district; Repton; Lincoln; Scarborough; Pendleton, near Manchester, in bakehouses; Northumberland and Durham district; Scotland, in old houses, Solway, Forth, Tay, Dee, and Moray districts; Ireland, Armagh and Dublin.

HEDOBIA, Sturm.

This genus contains about eight species from Europe, Algeria, the Isle of France, and Mexico; they are, in spite of their small size, very striking and handsome insects, by reason of their distinct markings; Dr. Horn includes *Hedobia* and *Eucrada* under a separate tribe, Eucradini, which he separates from the Ptinini on the grounds that the antennæ are widely separated at base, and that the elytra are always cylindrical and do not embrace the flanks; one of the chief characters, however, of *Hedobia* lies in the very short and broad fifth joint of the tarsi; Reitter and others consider *Hedobia* to be quite distinct from the Ptinidæ, and in the catalogue of Heyden, Reitter, and Weise it is placed after *Anobium* and *Ernobius* with *Ptilinus* and *Ochina*, a position which in some respects seems certainly a reasonable one. There are five European species, of which one only occurs in Britain.

H. imperialis, L. Oblong, of a dark chocolate-brown colour, clothed with whitish squamose pubescence; head rather long, strongly pubescent, with eyes somewhat prominent, antennæ ferruginous, long and rather robust, feebly serrate; thorax very much narrower than elytra, somewhat constricted in front, with a patch of white pubescence on each side behind middle; scutellum distinct, quadrangular; elytra closely and somewhat rugosely punctured, with the apex, shoulders, a large patch at base narrowing triangularly to suture, the suture itself, and a white spot on each side behind middle clothed with whitish pubescence; these markings are somewhat variable, and often more or less confluent; the shoulders are square and well marked; legs ferruginous, last joint of tarsi very short and broad. L. 4-5½ mm.

In old hedges, &c. ; occasionally taken on the wing; rather widely distributed in England and Wales, but, as a rule, not common; London district, not uncommon,

Faversham, Darent Wood, West Wickham, Coombe Wood, Forest Hill, Mickleham, Dulwich, Caterham, Weybridge, Peckham; Tonbridge; Shipley, near Horsham; Harwich; Brandon, Suffolk; Deal; Hastings; Glanvilles Wootton; Devon; Bath; Coleshill; Knowle; Needwood; Shrewsbury; Repton; Sudbrook and Nocton, near Lincoln; Llangollen; Scarborough; Foxhill, near Manchester; it is not recorded by Dr. Sharp from Scotland, but Stephens mentions it as taken at Jedburgh; it is possible that this may be in error, as it does not appear to have occurred in the Northumberland and Durham district.

MEZIUM, Curtis.

The species belonging to this and the succeeding genus may very easily be known by their curious appearance; as Professor Westwood observes, they might almost be mistaken when at rest for drops of blood; the elytra are globose and connate, and extremely smooth and glossy, the antennæ approximate at base, stout and strongly pubescent or squamose, and the legs long and robust, with the femora clavate at apex; in *Mezium* the thorax is clothed with thick yellowish pubescence, a character which at once distinguishes it from *Gibbium*; the genus which we are now considering contains about half-a-dozen species, of which three occur in Europe, and the remainder have been described from Algeria and North and South America; they are found in various substances, but appear mostly to frequent seeds of various kinds, and also the hair or integument of animals; a considerable number are recorded as having been once found in an old opera hat, and they are somewhat injurious occasionally to collections of insects; the larva, in spite of the peculiar appearance of the perfect insect, does not appear to differ from those belonging to the other genera of the family; the pupa, as mentioned by Westwood (Classification, i. 272), is enclosed in a cocoon formed of silky matter, mixed with the excrements of the larva.

M. affine, Boield. (*sulcatum*, Sturm, nec F.). Of a lighter or darker reddish-brown colour, with the head and thorax, as well as the antennæ and legs, clothed with thick and strong yellowish pubescence, a point that will at once distinguish the species from *Gibbium*; antennæ rather long and robust, with the last joint stouter and less acuminate than in the last-mentioned genus; thorax with four more or less distinct raised ridges, and the posterior margin thickened; elytra narrowed towards base, but much widened behind, very smooth, shining, and glabrous, and much inflated; legs long and rather stout, with the apex of the femora clavate, last joint of tarsi narrower than the preceding. L. 2-3 mm.

In seeds, and various kinds of decaying animal and vegetable refuse; not common, but it has occasionally occurred abundantly in one or two localities; London, old houses (Dr. Power has taken it in Burton Crescent); Swansea; Manchester (in dry-salters' warehouses); Scotland, not indigenous; "Edinburgh, among a consignment of Decapods from Australia," Murray's Cat.

GIBBIUM, Scopoli.

This genus, which bears a very close resemblance to the preceding, may at once be distinguished by its glabrous thorax, more laterally compressed elytra, and the longer and more acuminate last joint of the antennæ; four species have been described, two from Europe, and one each from Columbia and Cuba; one of these has been found in Britain, but it occurs very rarely, and is very probably an importation; the species are found under the same circumstances as the preceding, in dried decaying animal and vegetable substances; Westwood mentions the discovery by M. Audouin of a large quantity of *Gibbium scotias* in a small antique vase, dug up at Thebes in Egypt, in which a small quantity of semi-fluid resinous matter was also contained; M. Audouin was, however, of the opinion that the insects had been attracted to the matter at a subsequent period, rather than that they had been embalmed in it by the Egyptians.

G. scotias, F. (*psylloides*, Czemp.). Of a dark shining brownish or reddish-brown colour, with the thorax and elytra glabrous, smooth and very shiny; form strongly swollen and gibbose, somewhat compressed laterally; head rather long, furrowed between antennæ, which are long and rather stout, and strongly pubescent, with the last joint long and acuminate; thorax short; scutellum wanting; elytra narrowed towards base and much widened behind, strongly inflated; legs clothed with strong yellowish pubescence, long and rather stout, with the femora clavate at apex, last joint of tarsi narrower than the preceding. L. 2-3 mm.

In seeds, and decaying animal and vegetable refuse; rare; old houses in London; Esher; Bristol; Newcastle-on-Tyne; Scotland, not indigenous, "Arlary in Kinross-shire, among dried plants from India," Murray's Cat.

ANOBIIDÆ.

The members of this family differ from the Ptinidæ chiefly in the formation of the antennæ, which are either serrate or pectinate (occasionally flabellate), or have the three terminal joints elongate and thickened, forming a more or less distinct loose club; in one genus however, *Dryophilus*, the last three joints in the male are very long and slender; they are inserted immediately in front of the eyes, and are more or less distant at base, whereas in the Ptinidæ they are inserted upon the front, and are nearly always contiguous at base; the posterior femora when in repose are received by the hind coxæ, which have their hind margin excavated for that purpose; the thorax is not or scarcely narrower than the elytra, and is nearly always margined; the tarsi are all 5-jointed; the species, as a rule, are more or less cylindrical, except in the Dorcatomina; the tibial spurs are wanting or obsolete, a character that separates the family from the Bostrichidæ and Lyctidæ.

A considerable number of genera and species are contained in the family, which is by many authors included as a tribe under the Ptinidæ; these are widely distributed over the surface of the world, but appear to be chiefly characteristic of temperate and colder climates; five of the eight European genera are represented in Britain; the larvæ differ but little from those of the Ptinidæ, and do not require any separate description. Professor Westwood observes (Classification, i. 271) that when full fed they construct a cocoon of soft silky matter, mixed with the substances upon which they have been feeding, within which they are transformed to pupæ, and that it would appear that the larva has the instinct to continue the boring of its burrow until it has nearly reached the surface, so that a slight barrier only remains, which the perfect insect can pierce without difficulty.

The family may be divided, for convenience sake, into the following three tribes:—

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| I. Antennæ not serrate or pectinate, with the last three joints longer and usually broader than the preceding; first ventral segment not excavated for the reception of the hind legs (in our species) * | ANOBIINA. |
| II. Antennæ serrate or pectinate, rarely flabellate, with the last joints, as a rule, not longer than the rest; first ventral segment not excavated for the reception of the legs | XYLETININA. |
| III. Antennæ with the three last joints serrate, much enlarged; first ventral segment deeply excavated, on each side, for the reception of the hind legs. | DORCATOMINA. |

ANOBIINA.

In this tribe the head is much deflexed, and received when at rest on the under surface of the thorax, which is excavated beneath to receive it, except in *Dryophilus*; this latter genus might perhaps, with advantage, be formed into a separate tribe, as it also differs in the formation of the antennæ, which have the last joints more slender in the male, and are more contiguous at base; the antennæ, in the tribe, are, as Dr. Horn observes, usually received into a more or less distinct excavation between the front and middle coxæ, which is sometimes prolonged into the metasternum, but the head is never excavated beneath for their reception; the fifth joint of the tarsi is very often dilated and membranous beneath.

The species belonging to this tribe are mostly found in old wood, and several frequent old houses; during the season of pairing they have a habit of striking their jaws upon the wood on which they are standing as a signal to their mates, who reply in the same manner; this produces a ticking noise, which is scarcely audible in the day when various other

* The first ventral segment is excavated in *Theca* and *Eupactus*; the former genus, however, appears to be now referred by some authors to the Dorcatomina.

noises are going on, but is very distinct in the stillness of the night; as this sound would chiefly be heard by people sitting up through the night to nurse friends or patients who are seriously ill or dying, it has come to be associated by the superstitious with approaching death, and hence the name of "Death Watch" has been given to the insects, as the noise somewhat resembles the ticking of a watch; thus the poet Gay says, "The solemn death watch clicked the hour she died;" the sound is certainly a somewhat monotonous and worrying one, as I can testify from hearing it night after night in a room in which I used to sleep at Gloucester; it is produced by several species, but those best known are *Anobium domesticum* and *Xestobium tessellatum*. In the Entomologist's Monthly Magazine, vol. iii. p. 279, Mr. F. Smith records his observations as to the habits of the latter species; he says, "Taking a lead pencil, and giving half-a-dozen taps in rapid succession on the table, close to the box in which they had travelled, they shortly commenced to answer. Raising themselves on their anterior legs, they commenced bobbing their heads up and down rapidly, tapping with their mandibles on the bottom of the box. This performance I could elicit almost at pleasure; the number of taps varied from four to five—usually five are given." Some authors have held the opinion that the larvæ also produce the sound, and that they do so by tapping in order to ascertain the thickness of the wood that is left between them and the surface; there does not, however, seem sufficient evidence to warrant the acceptance of this belief.

The larvæ of *Anobium domesticum* sometimes do very great damage to furniture, and are the cause of the little round holes which we so often see in old cabinets, chairs, &c., these being the entrances to their galleries; they may to a great extent be got rid of by the application of benzine with which a small quantity of carbolic acid has been mixed; if the furniture is delicately polished, the benzine had better be applied alone; unpolished furniture would be best freed from the pest by immersion in boiling water, if the articles are not too unwieldy to admit of such treatment; moderately strong carbolic acid will at once destroy both grubs, eggs, and perfect insects, but the furniture to which it is applied will require repolishing.

- I. Elytra with punctured striæ distinct, at all events at sides; posterior coxæ distant.
 - i. Antennæ subcontiguous at base, with the last three joints slender and long, especially in the male . . . DRYOPHILUS, Chevrolat.
 - ii. Antennæ distant at base, with the last three joints enlarged, evidently broader than the preceding.
 1. Thorax not margined at sides . . . PRIOBIMUM, Mots.
 2. Thorax margined at sides . . . ANOBIUM, F.
- II. Elytra without punctured striæ; posterior coxæ contiguous.
 - i. Tarsi with the fifth joint broad; tibiæ stout . . . XESTOBIUM, Mots.
 - ii. Tarsi with the fifth joint elongate; tibiæ slender . . . ERNOBIUS, Thoms.

DRYOPHILUS, Chevrolat.

This genus contains seven species, all of which inhabit Europe;

they are found in old wood, by sweeping under fir trees, &c.; the females differ considerably from the males by reason of their much shorter antennæ, smaller head, and less prominent eyes; one of our species is not uncommon locally; the other is extremely rare.

- I. Size smaller; antennæ with joints 2-8 longer than broad; elytra black or pitchy black; scutellum without pubescence *D. pusillus*, Gyll.
 II. Size larger; antennæ with joints 2-8 much compressed, subquadrate or transverse; elytra, at least at shoulders and apex, brownish or reddish-brown; scutellum strongly pubescent *D. anobioides*, Chevr.

D. pusillus, Gyll. (*striatellus*, Beck). Oblong, dull black, clothed with extremely fine greyish pubescence, very finely and rugosely punctured; head and antennæ varying in the sexes, the latter pitchy with the base ferruginous, sometimes entirely ferruginous; thorax transverse, distinctly narrower than elytra, with the sides rather strongly rounded, and without distinct margins; scutellum small, semicircular; elytra with fine striæ which are obsoletely punctured, interstices finely coriaceous; legs in part ferruginous, tarsi with the first joint longer than the rest. L. $1\frac{1}{2}$ -2 mm.

Male with the head together with eyes (which are very large and prominent) much broader than thorax; antennæ considerably longer than half the body, with the three last joints very long and slender.

Female with the head together with eyes narrower than thorax; antennæ about as long as half the body, with the three last joints much shorter.

By beating fir trees, also by sweeping the grass and herbage beneath them; very local; London district, not uncommon, Esher, Mickleham, Woking, Shirley, Chobham, Gomshall, Weybridge, Caterham, Reigate, Birch Wood, Faversham, Chatham, Tilgate, Tonbridge; Brandon, Suffolk; Betteshanger, Kent, and New Forest, in profusion (Gorham); Ringstead Downs, near Hunstanton, Norfolk, where I obtained one female specimen by beating fir trees in August 1883.

D. anobioides, Chevr. (*compressicornis*, Muls.). Very like the preceding in shape and general appearance, but, on an average, larger, and distinguished by having the elytra, at least at shoulders and apex, of a brownish or obscure ferruginous colour; the antennæ and legs also are lighter; the species may also be known by its strongly pubescent scutellum, and by the fact that the first ventral segment is rounded in the middle at apex and evidently produced, whereas in the preceding species it is not or only feebly produced; the third to the eighth joints of the antennæ are considerably shorter, and the antennæ themselves are more robust. L. $2\frac{1}{2}$ -4 mm.

In old stumps of broom, &c.; it has also been reared from dead bramble sticks; very rare; Plumstead, bred from old broom stumps, June (S. Stevens); Coombe Wood; Chobham; Plumstead.

PRIOBIMUM, Motschulsky. (*Grynobius*, Thomson.)

Three species belonging to this genus have been described, all of which occur in Europe; they closely resemble *Anobium*, but may be known by having the thorax not margined at sides, and the last three joints of the antennæ less elongate.

P. castaneum, F. (*tomentosum*, Muls.). Oblong, subcylindrical, of a dull fuscous-brown or reddish-brown colour, clothed with short yellowish pubescence, antennæ and legs red; head rather large, with eyes prominent, antennæ short, with the first and second joints enlarged, and the last three forming an elongate club, which is longer in the male than in the female; thorax broader than long, considerably narrower than elytra, with the sides rounded and not margined, contracted in front, with a more or less distinct longitudinal central furrow; upper surface very thickly and finely and rugosely punctured; scutellum round, rather prominent, strongly pubescent; elytra parallel-sided, more rounded at apex in the female than in the male, with very strong crenate punctured striæ, and the interstices finely but plainly punctured; legs moderately robust, with the tarsi rather broad. L. 4-5 mm.

In dead hedges, old posts, &c.; rather common, and apparently generally distributed throughout the greater part of England and Wales, but rarer further north; Scotland, rare, on trunks of trees, Tweed, Forth, Tay, and Moray districts; Ireland, Armagh and near Dublin, and probably generally distributed.

ANOBIUM, Fabricius. (*Byrrhus*, Geoffroy.)

This genus contains more than fifty species, of which about half are found in Europe; the remainder have been described from North America, Mexico, Chili, South Africa, Madeira, Ceylon, and New Zealand; they may be known by their subcylindrical form, margined thorax, regularly striated elytra, and strongly deflexed head, and also by having the last three joints of the antennæ elongate, but evidently broader than the preceding; four species occur in Britain, which may be distinguished as follows:—

I. Eyes not hairy; antennæ with the second joint about equal in length to third.

i. Anterior part of metasternum excavated to receive antennæ.

1. Thorax with a large patch of yellowish pubescence on each side near posterior angles, which are right angles; alternate interstices of elytra distinctly raised at base; size larger

A. DENTICOLLE, Panz.

2. Thorax with at most a small indistinct patch of greyish pubescence on each side near posterior angles, which are obtuse; alternate interstices of elytra not or scarcely raised; size smaller . . .

A. DOMESTICUM, Fourc.

- ii. Anterior part of metasternum not excavated to receive antennæ *A. FULVICORNE*, Sturm.
 II. Eyes hairy; antennæ with the second joint twice as long as third *A. PANICEUM*, L.

A. denticolle, Panz. (*Dendrobium denticolle*, Muls.). Subcylindrical, rather broad, of a dull fuscous brown colour, upper surface clothed with very short fuscous grey pubescence; head sunk in thorax, antennæ red, rather slender; thorax convex, with the sides moderately parallel, but bisinuate, posterior angles right angles, carinate; upper surface closely punctured, somewhat uneven, with a large patch of yellowish pubescence near the hind angles, which extends more or less across the whole base; scutellum round, pubescent; elytra with punctured striæ, the punctures being rather fine, alternate interstices raised at base; legs red, rather stout, tarsi broad with the last joint short. L. $4\frac{1}{2}$ –5 mm.

In the male the antennæ are longer than in the female, and have the last joints more elongate.

In old oak trees; very rare; Richmond Park, Surrey (Power and Champion); Erith, on old fence (S. Stevens).

A. domesticum, Fourc. (*striatum*, Ol., nec F.; *pertinax*, F., nec L.; *Dendrobium domesticum*, Muls.). Subcylindrical, rather narrow, of a dull fuscous brown colour, thickly clothed with greyish pubescence, antennæ and legs reddish; head sunk in thorax, antennæ rather long and slender; thorax longer than broad, uneven, plainly margined, narrowed in front and sinuate before posterior angles which are obtuse, very finely and thickly punctured, with a fine dorsal channel; scutellum rounded; elytra parallel-sided, with rather fine crenate striæ, alternate interstices not raised; legs moderately long. L. 3–4 mm.

Male with the antennæ longer than in female, and with the last ventral segment of the abdomen slightly impressed transversely before apex.

In old wood; usually in houses and old buildings, but also in dead hedges, old trees in woods, &c.; very common and generally distributed throughout the kingdom.

A. fulvicorne, Sturm. (*Hadrobregmus fulvicornis*, Thoms.). In general appearance this species very much resembles the preceding, and light examples may easily be mistaken for it; as a rule, however, it is of a much darker colour, being often almost black or fuscous black; it may, moreover, be known by having the sides of the thorax somewhat obsoletely margined, and the fact that the hind coxæ are sinuate on their posterior margin; the anterior part of the metasternum is not excavated to receive the antennæ; the pubescence is somewhat different, but this is not a very obvious character. L. $2-3\frac{1}{2}$ mm.

In dead hedges, &c.; local; London district, common, Darenth, Chatham, Peckham, Sevenoaks, Lee, Dulwich, West Wickham, Birch Wood, Mickleham (in which latter locality Dr. Power has taken several very small specimens); Tonbridge;

Hastings; Glanvilles Wootton; New Forest (common); Swansea; Llangollen; Evesham; Trench Woods; Gloucester; it appears to be confined to the South Midland and Southern districts, as far as is at present known.

A. paniceum, L. (*Sitodrepa panicea*, Thoms.; *Artobium paniceum*, Muls.). Oblong, subcylindrical, convex, of a rather shining ferruginous or reddish-testaceous colour, clothed with greyish or whitish pubescence; antennæ and legs clear reddish-testaceous; eyes hairy; thorax even, narrowed in front, with the sides gradually rounded; elytra with fine punctured striæ, interstices rather broad, very finely punctured; legs slender. L. 2-3 mm.

The antennæ are shorter in the female than in the male, and have the three last joints less elongate.

A common cosmopolitan species, occurring in old flour, bread, biscuit, skins, medical stores, &c.; it has been introduced into many of our large towns, and gradually spread; in Scotland it appears only to have been recorded hitherto from the Forth district.

XESTOBIUM, Motschulsky. (*Cnecus*, Thoms.)

This genus contains four European species, which may easily be distinguished from all our other Anobiina except *Ernobius* by the absence of striæ on the elytra; from *Ernobius* they may be known by their stouter tibiæ and the broad fifth joint of the tarsi; our single species *X. tessellatum* is the largest of the British Anobiidæ; it is not uncommon locally in old decaying stumps and in old buildings; its larva is figured by Westwood (Classification, i. p. 269, fig. 30, 11); a reference to this figure will at once show the very close resemblance it bears to the Lamellicorn larvæ by reason of its curved form and the enlarged last segment of the abdomen.

X. tessellatum, F. (*rufo-villosum*, De G.; *pulsator*, Schall.). A large and conspicuous species, convex, subcylindrical, of a dark chocolate-brown colour, thickly tessellated with patches of yellowish pubescence, which gives the upper surface a variegated appearance; the sculpture of the upper surface is finely and thickly scabrous; head rather deeply sunk in thorax, eyes moderately large, convex; antennæ reddish, rather short and stout; thorax about as broad as elytra, contracted in front, with the anterior and posterior margins produced, central furrow obsolete; scutellum semicircular; elytra parallel-sided, with traces of raised lines; legs ferruginous, stout and robust, tarsi short and broad, with the fifth joint transverse. L. 5-7 mm.

In old trees, willow, oak, &c.; often in old wood in houses and churches; London district, common and generally distributed; Ulting, Essex; Suffolk; Pegwell Bay; St. Peters; Hastings; Glanvilles Wootton; New Forest; Devon; Swansea; Cromer; Windsor; Henley; Repton; Needwood, Staffordshire; Dunham Park, Manchester; not recorded from the Northumberland district; Scotland, very rare, Solway district; "Raehills," Rev. W. Little, Murray's Cat.

ERNOBIUS, Thomson. (*Liozoum*, Mulsant.)

The members of this genus are distinguished from *Xestobium* by the slender last joint of the tarsi, and from our other Anobiina by the absence of punctured striæ on the elytra; they are about thirty in number; the majority occur in Europe, but a few have been described from North America; three are found in Britain. Kiesenwetter (Naturgesichte der Insect. Deutsch. vol. v. p. 125) says that the females of *Ernobius mollis* lay their eggs in spring on the young shoots of newly felled pine and fir trees, especially those that have been attacked by *Hylesinus piniperda*, *Tortrix buoliana*, or other insects that injure these trees; the young larvæ bore into the pith, and feed almost exclusively on that substance, which they gradually consume and reduce to frass; before changing to pupæ they bore a round hole to the extreme outer surface, so that the perfect insect can easily emerge into the open air; the perfect insect appears in the following spring, its transformations occupying just a year for their completion.

- I. Antennæ with joints 5-8 elongate; colour lighter or darker ferruginous, or testaceous.
 - i. Thorax even, or with very obsolete and indistinct prominences *E. MOLLIS*, L.
 - ii. Thorax uneven, with small raised prominences before scutellum *E. ABIETIS*, F.
- II. Antennæ with joints 5-8 very short, transverse; colour pitchy or pitchy-black *E. NIGRINUS*, Sturm.

E. mollis, L. Oblong, convex, testaceous-brown or ferruginous, clothed with rather thick pale pubescence, thickly and finely punctured throughout; head rather large, with eyes large and prominent, antennæ slender; thorax broader than long, narrowed in front, with the posterior angles rounded; scutellum roundish triangular; elytra rather long, parallel-sided, subcylindrical; legs reddish-testaceous, rather slender, with the fifth joint double as long as the fourth. L. $3\frac{1}{2}$ -5 mm.

Male with the antennæ longer than in the female, and the joints longer in proportion.

In old palings, under bark, &c.; often by sweeping under fir trees; it is sometimes found in old houses; somewhat local, but not uncommon and generally distributed throughout England and Wales; Scotland, local, Tweed, Forth, Tay, Dee, and Moray districts; it is probably moderately common in Ireland.

E. abietis, F. (*brevicorne*, Bach.). Very like the preceding, but on an average smaller, with the thorax less even and the sides of the same less rounded, the anterior angles being almost right angles; according to Thomson the fifth to the eighth joints of the antennæ do not differ much in length, whereas in *E. mollis* the fifth joint is much longer than those on either side of it; the fifth tarsal joint is also shorter. Stephens says that it differs from *E. mollis* "in having the thorax distinctly truncate behind, the antennæ shorter with the three terminal joints manifestly increas-

sated, and by its more ovate form ;" it must be admitted that some of the characters given are unsatisfactory, and appear to vary somewhat in different specimens of *E. mollis*. L. 3-4 mm.

In pines and fir trees ; very rare ; Stephens records it as taken in Scotland by Mr. Wilson, and at Penllegare, Swansea, by Mr. Dillwyn ; in Dr. Power's collection there is a specimen taken by Turner at Alvie, near Forres, in 1866, which is referred to the species ; but, although it does not agree with *E. mollis*, I hardly think that it belongs to *E. abietis*. Dr. Sharp omits it entirely from his Scottish list, and I think that it is quite possible that we do not possess the true species as British ; at all events, it requires more confirmation.

E. nigrinus, Sturm. Elongate, subcylindrical, of a black or pitchy-black colour, clothed with fine greyish pubescence, palpi and tarsi rufous ; the tibiae also are often reddish ; head large, with eyes prominent, antennae pitchy, with base lighter, longer than half the body, with joints 5-8 very small, transverse (a point that will at once distinguish the species), joints 9-11 long ; thorax broader than long, narrowed in front, rather narrower at base than elytra, finely and closely punctured, with a more or less distinct central furrow, posterior angles rounded ; elytra long, parallel-sided, closely and finely punctured ; legs slender, fifth joint of tarsi double as long as fourth ; varieties occur in which the elytra are fuscous-brown or reddish-brown. L. 3-4 mm.

On Scotch fir ; local in the Highlands of Scotland, Tay, Dee, and Moray districts ; it is sometimes common where it occurs ; it was one of Charles Turner's captures, although one specimen existed in Mr. Crotch's collection, without locality, before he found it ; this specimen was formerly in Mr. Wollaston's collection.

XYLETININA.

Dr. Horn (Classification of the Coleoptera of North America, p. 225) remarks that the members of this tribe differ from those of the preceding only by the antennae being curved around the under surface of the head in repose, instead of being extended straight along the middle of the body ; he does not, however, include the genus *Ptilinus*, and *Ochina* does not occur in the North American fauna ; the chief difference appears to lie in the formation of the antennae, which are serrate or pectinate, and, in the male of *Ptilinus*, flabellate ; if we exclude *Hedobia*, which by some authors is included in the tribe, the *Xyletinina* contain nine European genera and thirty-five species, of which four genera, each represented by a single species, are found in Britain ; *Lasioderma serricorne*, however, is very doubtfully indigenous.

- I. Antennae flabellate in male, pectinate in female PTILINUS, Geoff.
- II. Antennae serrate.
 - i. Prosternum without depression for the reception of the head ; elytra without striae OCHINA, Steph.
 - ii. Prosternum with depression for the reception of the head.
 - 1. Elytra strongly striated XYLETINUS, Latr.
 - 2. Elytra without striae LASIODERMA, Steph.

PTILINUS, Geoffroy.

This genus contains thirteen or fourteen species, of which five are found in Europe; the remainder have been described from the Atlantic Islands, Senegal, Ceylon, and North America; one species only occurs in Britain; it may easily be known by the very peculiar flabellate antennæ of the male, and its long cylindrical shape, as well as by the fact that there are no distinct striæ on the elytra.

P. pectinicornis, L. (*impressifrons*, Küst.). Elongate, cylindrical, parallel-sided; colour variable, either entirely fuscous-black, or fuscous with the elytra brown or reddish-brown, or reddish with the apex fuscous; antennæ and legs ferruginous, the processes of the joints of the former being sometimes fuscous at apex; head sunk in thorax, eyes rather large, convex; thorax subquadrate, with sides rounded, granulose, the granulations being more distinct in front, with a raised smooth line at base before scutellum; elytra elongate, with fine rows of punctures, but without striæ, with obsolete traces of raised lines; legs moderate, with the tarsi nearly as long as the tibiæ, first joint elongate. L. 3–5 mm.

Male with the antennæ strongly flabellate, and with a dull raised tubercle on each side of thorax.

Female with the antennæ shorter, pectinate, and with a shining raised tubercle on each side of thorax.

In old posts; also in old willow, oak, fir, whitethorn, hornbeam, &c.; not uncommon and generally distributed throughout the greater part of England and Wales; rarer in the extreme north; Northumberland and Durham district, Durham, Sunderland, Ravensworth, and Long Benton; Scotland, very rare, in old trees, Solway and Forth district; Ireland, near Dublin.

OCHINA, Stephens.

This genus contains two European species, one of which is found in Britain; it may be known by its faintly serrate antennæ, of which the last joints are not, or scarcely, broader than the preceding, and by the absence of elytral striæ.

O. hederæ, Müll. (*ptinoides*, Marsh.; *Cittobium hederæ*, Muls.). Oblong oval, convex, elytra somewhat depressed on disc, of a dark reddish-brown colour, clothed with close greyish pubescence, with the disc of thorax, and the base and apex and a fascia behind middle of elytra without pubescence, which gives the insect a variegated appearance; antennæ and legs reddish-testaceous; head not deeply sunk in thorax; thorax broader than long, narrowed in front, even, with distinct side margins, under-side without depression for the reception of the head; scutellum rounded triangular; elytra rather broad, closely, finely and irregularly punctured, with very indistinct traces of raised lines; legs moderately robust, first joint of tarsi elongate. L. $2\frac{1}{2}$ –3 mm.

In old ivy; occasionally by sweeping; local; London district, not uncommon and generally distributed; St. Peters; Pegwell Bay; Deal; Hastings; New Forest; Glanvilles Wootton; Devon; Monmouthshire; Llangollen; Barmouth; Trench Woods; Knowle, near Birmingham; Repton; Dunham Park, Manchester; Northumberland district, not uncommon about Gilsland and Lanercost; Scotland, very rare, Dee district, found near Arbroath by Mr. Hislop; Ireland, near Dublin and Waterford.

XYLETINUS, Latreille.

This genus cannot be confused with any other by reason of its short broad form, strongly serrate antennæ, and strong elytral striæ; it contains between thirty and forty species, of which twelve are found in Europe, and the remainder are very widely distributed, having been described from Siberia, North and South America, the Canary Islands, Ascension Island, and North Africa; our single British species is very seldom met with.

X. ater, Panz. (*serratus*, Panz.; *Sternoplus ater*, Muls.). Oblong ovate, rather short and broad, black, dull, clothed with extremely fine greyish pubescence; head large and broad, with eyes prominent, antennæ moderately long, black, with base red, strongly serrate; thorax broader than long, as broad at base as elytra, strongly narrowed in front, very finely sculptured; scutellum rounded behind; elytra broad, subparallel or with sides feebly rounded, with strong but rather feebly punctured striæ; interstices very finely rugose; legs rather robust, femora black, tibiæ and tarsi red. L. $2\frac{1}{2}$ –4 mm.

Male with the antennæ more strongly serrate than in the female; female larger than the male, with the last ventral segment of the abdomen furnished with two granules which are distant from one another.

In decayed wood; rare; Charlton, Kent (Janson); Cobham (Stephens); Tonbridge (Horner); Ascot Heath, on old fence (S. Stevens); Cowfold (Power); Mickleham; Hertford; Shipley, near Horsham, and Rusper (Gorham); Spitchwick, Devon, in moss (Leach); Newark-on-Trent (Hadfield); in the latter locality it has occurred not uncommonly on old palings.

LASIODERMA, Stephens.

This genus contains about a dozen species, which are mostly found in Europe; one or two, however, have been described from North America; they may be known by their finely, but distinctly, serrate antennæ, coupled with the fact that the elytra are not striated; one species is reputed to be British, but it is almost certainly an importation.

L. serricorne, F. (*testaceum*, Duft.). Oval, convex, short and broad, of a ferrugino-testaceous colour, rather shining, clothed with fine greyish pubescence; head large and broad, deeply sunk in thorax, antennæ yellowish-red, with the first joint much enlarged, finely but very distinctly serrate; thorax much broader than long, convex, even,

gradually narrowed in front, very finely punctured, posterior angles rounded; scutellum small; elytra very finely punctured; legs clear reddish-yellow, moderately long, with the tarsi short, the first joint being twice as long as the second. L. 2 mm.

A cosmopolitan species, occurring in ginger, liquorice, &c.; London, and probably other large towns into which it has been imported. Mr. Champion says that it is not uncommon, but it is very rare in our collections.

DORCATOMINA.

The species belonging to this tribe differ entirely in shape and general appearance from the rest of the Anobiidæ, being of a short round oval or almost hemispherical form, and very convex; the head when deflexed is received into a hollow in the prosternum, and the mandibles are applied to the mesosternum or the prolongation of the metasternum between the intermediate coxæ; the antennæ are received into a deep cavity between the anterior coxæ; they are short, with the three last joints serrate, and, as a rule, much dilated; the first joint is also enlarged; the first ventral segment is deeply excavated on each side for the reception of the hind legs.

Seven genera and twenty-three species are included in the European catalogue as belonging to the tribe; of these, three genera, represented by four species, are found in Britain.

- I. Eyes divided beyond middle; antennæ 9-jointed . . . CÆNOCARA, *Thoms.*
- II. Eyes entire.
 - i. Antennæ 10-jointed, rarely 9-jointed; form oval . . . DORCATOMA, *Herbst.*
 - ii. Antennæ 8-jointed; form nearly hemispherical . . . ANITYS, *Thoms.*

CÆNOCARA, Thomson.

This genus contains half-a-dozen species from Europe and North America; they may be known from our other members belonging to the tribe by having the eyes divided beyond the middle; the prosternum is furnished behind with a very short process, which is broadly emarginate at apex.

C. bovistæ, Hoff. (*subalpina*, Bon.; *Enneatoma subalpina*, Muls.). Subglobose, almost hemispherical, convex, but slightly depressed on disc, about as long as broad, shining black, with the apex and margins of the elytra sometimes reddish, sparingly clothed with rather short greyish pubescence, finely but not very closely punctured, the punctuation of the elytra being less close than that of the thorax; head moderately large with eyes somewhat prominent, antennæ pitchy, 9-jointed, with the first joint long and enlarged, the second very much smaller, the four following very small, and the last three much enlarged; thorax much broader than long at base, gradually and strongly narrowed in front, with base bisinuate, posterior angles blunt; elytra with well-

marked shoulders, confusedly punctured, with three impunctate striæ on each side near margin; legs pitchy-red or ferruginous, with tarsi short. L. 2 mm.

In *Lycoperdina bovista*, *Bovista plumbea*, &c.; also occasionally by sweeping; rare; Mickleham; Tonbridge (Horner and Blatch); Deal; Bearsted, Kent, by sweeping (Gorham); Norwich, Horning, and Ashwicken (Power); Windsor; Spitchwick, Devon (Leach); Barmouth and Blackpool (Chappell, Taylor, and Sidebotham).

An account of this beetle is given by Mr. Sidebotham in the Entomologist's Monthly Magazine, vol. viii. p. 180; he says that in September, 1871, he found the larvæ of the species in small dry specimens of *Bovista plumbea* and other small fungi on a sandy flat near Barmouth; in less than a week, several perfect specimens of the insect made their appearance; sometimes the larva appears to eat its way out of the fungus, and at once changes into the pupa state, from which it turns into the perfect insect in about ten days; but usually it forms a cocoon of spores, changing to the pupa state inside the fungus, out of which the perfect insect eats its way; the species appears to be extremely local.

DORCATOMA, Thomson.

The species belonging to this genus may be distinguished from their allies by their more elongate form and less convex disc; the eyes are entire, and the antennæ 10-jointed, rarely 9-jointed; they are about twenty in number, and are widely distributed, occurring in Europe, South Africa, and North and South America; eight are found in Europe, of which two are inhabitants of Britain; they are both found very rarely in decayed trees.

- I. Form narrower; punctuation of elytra less close;
abdomen with all the segments free **D. CHRYSOMELINA**, Sturm.
- II. Form broader; punctuation of elytra closer; abdomen with the first segments soldered together in the middle **D. FLAVICORNIS**, F.

D. chrysomelina, Sturm (*dresdensis*, F., *nec* Herbst.). Oblong-oval, clothed with uneven slightly erect greyish pubescence, shining black, with the antennæ, palpi, and legs testaceous, the latter being sometimes partially infuscate; head rather large; antennæ with the first joint large, the second somewhat elongate, but very much smaller, the following five very small, and the last three very much enlarged, forming a loose club; thorax transverse, gradually and rather strongly narrowed in front, bisinuate at base; scutellum small; elytra with sides subparallel to posterior third and thence narrowed to apex, not very closely punctured, with two striæ and a row of punctures on each at sides; under-side very finely and thickly punctured, with larger round flat punctures interspersed; legs moderately long, tarsi short. L. 2 mm.

Male with the eighth joint of the antennæ subtransverse and strongly toothed internally, the ninth triangular, and the last oblong oval.

In decayed oak trees; rare; Peckham (Smith and Janson); Richmond Park; Esher; Hyde Park, in old oak (S. Stevens); Tonbridge (Horner); Denton, Norfolk (Cruttwell); Barton, Cheshire; Stretford, near Manchester (Reston); Dunham Park, Manchester (Chappell).

D. flavicornis, F. Of a broader and shorter form than the preceding, and easily distinguished by the punctuation of the elytra, which is much closer, and causes them to present a duller appearance; the antennæ and legs are of a lighter colour, and the last joints of the former are not so much enlarged; the punctuation of the under-side is extremely fine, with an intermixture of larger punctures; the first segments of the abdomen are soldered together in the middle. L. $1\frac{1}{2}$ –2 mm.

In decayed trees; rare; Forest Hill (Marsh); Purley (Douglas); Birdbrook and Esher (Power); Southend and New Forest, bred in numbers (Gorham); Hastings district (Hurst Green) (Butler); Sherwood Forest (Matthews).

ANITYS, Thomson. (*Amblytoma*, Mulsant.)

This genus contains two species, both of which are found in Europe; one of these occurs in Britain, which may be known by its 8-jointed antennæ and very globose, almost hemispherical form, and, as a rule, by its testaceous colour; the latter point, however, must not be altogether relied on, as reddish varieties of *Cænocara* and *Dorcatoma* are occasionally found; it is very rare, and inhabits dead trees.

A. rubens, Hoff. Subhemispherical, very convex, sparingly and finely pubescent, ferruginous or reddish-testaceous, rather shining; head moderately large, eyes undivided, antennæ short; thorax transverse, gradually narrowed in front, narrowly but plainly incised at apex, very finely punctured; scutellum short; elytra broad, slightly narrowed towards apex, finely and thickly and rugosely punctured, with traces of raised lines, and with three lateral striæ on each near margins; legs testaceous. L. 2–2 $\frac{1}{2}$ mm.

In decayed oak, &c.; rare; London district (Janson); Regent's Park; Southend (Gorham); Forest Hill, taken in abundance by Mr. Ingal in old oak (S. Stevens); New Forest (Gorham); Sherwood Forest (a large number of dead specimens taken in an old tree by Rev. A. Matthews); Ringway, Cheshire (Chappell).

BOSTRICHIDÆ.

The members of this family appear to be distributed over almost the whole world, and, as they become more known, the increasing importance of the family becomes more evident; in the Munich catalogue (vol. vi. p. 1787) only eleven genera and one hundred and twelve species are enumerated, but a very considerable number have since been added; there is, however, considerable difference of opinion as to

the constitution of the family and its position; some writers include under it the Lyctidæ and even the Sphindidæ, and one or two genera like *Hendecatomus*, which by others are included in the Cissidæ; others again regard the Bostrichinæ as a mere sub-family of the Ptinidæ or Anobiidæ; I have a note from the Rev. H. S. Gorham, who has taken much interest in the family, to the effect that the Cissidæ may possibly be regarded as a feeble and depauperized form of the Bostrichidæ; if we adopt this view, which seems a very reasonable one, the best plan will be to combine the Bostrichidæ and Cissidæ as one family, which arrangement will probably be ultimately adopted; the 4-jointed tarsi of the latter family may perhaps be urged as an objection, but it must be remembered that the first joint of the tarsi in the Bostrichidæ is very small and sometimes obsolete, although in certain exotic genera it is distinct, and that therefore in the depauperized forms at the end of the family we might expect it to disappear.

The question, at all events, does not much affect the British fauna, as we only possess three genera, represented by three species, two of which are extremely rare, and the third an importation; six genera and seventeen species are found in Europe.

The species are cylindrical and strongly convex, with the head (except in rare instances) strongly deflexed and covered by the thorax, which is then hood-shaped; a side view of the head of one of these insects presents just the effect of a monk's cowl; the antennæ are short, 10-jointed (in our genera), with a distinct 3-jointed club, inserted immediately in front of eyes at some distance from one another; the segments of the abdomen are of equal length, and the tarsi are 5-jointed, with the first joint very small, and sometimes more or less obsolete.

The larva of "*Apate capucina*" is figured by Westwood (Classification, i. p. 276, fig. 31, 10), who copied it from Ratzeburg (Forst. Insecten, Coleopt. tab. xiv.); it bears a resemblance to the larva of *Xestobium* and other Anobiidæ, but differs in having a smaller head and in being much narrower behind, the last segment being small; the front part of the body is broad, with the segments rugose transversely, but the hinder segments become gradually narrower; the mandibles are strong, and enable the insect to gnaw the wood upon which it feeds; the legs are well developed and rather long; this latter is a most important character, as it evidently separates the family from the Scolytidæ, with which several authors have associated it; in the latter family the larvæ very closely resemble those of the Bostrichidæ, but have no legs; if we consider the larvæ, and perhaps to a certain extent the perfect insect, the Bostrichidæ are more closely related to certain Lucanidæ (such as *Sinodendron*) than to the Scolytidæ; on the whole they are, however, best left near the Anobiidæ, although their relations to other groups must not be lost sight of.

- I. Last joint of the tarsi as long as or longer than the preceding taken together.
 - i. Club of antennæ with the two basal joints only slightly produced internally DINODERUS, Steph.
 - ii. Club of antennæ strongly and broadly serrate, with the two basal joints strongly produced internally RHIZOPERTHA, Steph.
- II. Second (apparently first) joint of the tarsi longer than the last BOSTRICHUS, Geoff.

DINODERUS, Stephens.

This genus contains about eight species, of which two are found in Europe ; three have been described from North America, and one from Teneriffe ; they are cylindrical insects, but less convex than some of the other members of the family, from which they also differ in not having the thorax drawn forward over the head ; in one or two points the genus forms a connecting link with the *Lycidæ*, and Thomson (*Skand. Col.* v. 201) includes it under that family.

D. substriatus, Payk. Elongate, subcylindrical, pitchy black, slightly pubescent ; head broad, rugosely punctured, with a transverse impression between antennæ ; antennæ inserted in front close to the eyes, with the basal joint short, robust, the second subglobose, the five following minute, and the last three forming an elongate rufescent club, of which the two basal joints are slightly produced internally, and the terminal one is subglobose and compressed ; eyes very convex ; thorax subquadrate, very globose and thickly tuberculated in front, with the tubercles slightly acuminate and largest towards anterior margin ; elytra often lighter than thorax, retuse behind, deeply and coarsely punctured, with the punctures irregularly and closely placed, but rarely disposed in striae ; legs pitchy red, with tibiæ and tarsi paler ; tibiæ compressed, toothed externally, tarsi short, simple. L. 3 mm.

In decayed trees ; very rare ; Darent Wood (where an example was taken on the wing by Mr. G. Lewis) ; New Forest (Stephens) ; Skellingthorpe, near Lincoln (Rev. H. Matthews).

RHIZOPERTHA, Stephens.

This genus is cosmopolitan, and of almost universal distribution ; it contains about thirty species, of which two have occurred in Europe ; our single British species occurs in foreign seeds, old flour, ship's biscuits, &c., and is evidently an importation, although it has to a certain extent become naturalized ; it may be distinguished by the elongate last joint of the tarsi, and the strongly and broadly serrate club of the antennæ.

R. pusilla, F. Oblong, subcylindrical, brownish-red or reddish-brown, almost glabrous ; head rather large, with eyes moderately prominent, antennæ reddish, with the two first joints large, and the last three forming a strong serrate club ; thorax longer than broad, slightly narrowed in front, with all the angles rounded, convex, rugosely punctured, scabrous and tuberculate in front ; elytra long, parallel-sided, with regular rows of coarse punctures, much depressed at apex ; legs ferruginous, tarsi apparently 4-jointed, with the last joint slightly longer than the preceding taken together. L. 2 mm.

In roots and seeds imported from abroad, old flour, biscuits, &c., also in wood of

casks; London; Birmingham; Scarborough, in flour mills; Northumberland district; it occurs in numbers where found, and has probably been imported into most of our large towns.

BOSTRICHUS, Geoffroy.

This genus contains upwards of twenty species, of which four occur in Europe; the remainder are widely distributed, species having been described from North, Central, and South America, South Africa and Madagascar, and the Australian region; the genus is therefore probably much more extensive than is at present known; it is closely related to *Apate*, and some authors prefer to include our single species under the latter genus.

B. capucinus, L. A large and fine species, elongate, cylindrical, dull, very slightly pubescent; head and thorax black, antennæ pitchy, elytra red; breast and base of abdomen black, the rest of the latter red; legs pitchy black with tarsi red; head thickly, rugosely, and rather strongly punctured, eyes small, antennæ short, hardly as long as head, with the club not strong; thorax roundish quadrangular, strongly convex, with the anterior margin impressed in middle, and with the upper surface strongly and rugosely punctured or granulose, the granules on the front half, especially at sides, forming strong tubercles; elytra scarcely broader than thorax, rather coarsely punctured and with traces of raised lines, rounded at apex; legs rather slender, tarsi apparently 4-jointed, the first joint being very minute, second joint longer than the last. L. 8-9 mm.

In decayed trees; very rare, and does not appear to have been taken for many years; Stephens gives as localities, London district, Cromer, Derbyshire, Notts, and Bewdley; in Dr. Power's collection there is a specimen from E. Brown's collection taken at Burton in 1867, and another from Bentley's collection; Mr. Dale records the capture of a single specimen by his father on the table-cloth in his dining-room at Glanvilles Wootton on July 2nd, 1854; Mr. Rye (British Beetles, p. 149, 1866) records a specimen as "recently taken near Highgate on a felled oak."

LYCTIDÆ.

This small family is usually included under the Bostrichidæ or Cissidæ, but appears to be distinct from either; its chief distinguishing points are the large 2-jointed club of the antennæ, and the elongate first ventral segment of the abdomen; the anterior coxæ are enclosed by the prosternum; the antennæ are 11-jointed, and the tarsi have the first joint obsolete, and the last longer than the rest taken together; the family contains two genera, *Lyctus* and *Trogoxylon*, but Thomson also includes under it *Dinoderus*, which does not, however, agree with it in one or two of the generally received distinguishing characters.

LYCTUS, Fabricius.

This genus contains about twenty species, of which three occur in

Europe ; the remainder are widely distributed, representatives being found in North, Central, and South America, Ceylon, New Zealand, &c.; they are narrow and elongate insects, and are found on freshly cut wood, in and about old stumps, &c.

I. Thorax very closely granulated, dull, with distinct central furrow *L. CANALICULATUS*, F.

II. Thorax rather closely and coarsely punctured, with central furrow less distinct, often more or less obsolete *L. BRUNNEUS*, Steph.

L. canaliculatus, F. (*oblongus*, Ol. ; *unipunctatus*, Herbst.). Elongate, subcylindrical, narrow, somewhat depressed on upper surface, of a lighter or darker brownish or reddish-brown colour, with the head and thorax sometimes a little darker, and sometimes a little lighter than the elytra ; head rather large, with eyes large and prominent, antennæ ferruginous, rather short and robust, with strongly marked 2-jointed club ; thorax quadrangular, a little longer than broad, gradually and slightly narrowed behind, with the front angles blunt and the hinder angles sharp right angles, sides finely crenulate, central furrow broad and distinct ; the pubescence on head and thorax is yellowish-grey, rather thick, and the upper surface is very thickly and finely granulose and dull ; scutellum small ; elytra long, parallel-sided, with the shoulders strongly marked, square, in darker specimens lighter than the rest of the upper surface ; striæ fine and finely punctured, interstices very finely punctured, with regular rows of short upright hairs ; legs ferruginous, rather slender, first abdominal segment much longer than the following. L. 3-5 mm.

On fresh oak palings, also on and about trees, and under bark, especially of oak and beech ; local, but occasionally abundant where it occurs ; Lee, Greenwich, Mickleham, Norwood, Croydon, Dulwich, Forest Hill, Tonbridge ; common in parts of Kent on hop poles ; Wroxham, Norfolk ; Windsor ; Birmingham ; Repton ; Church Stretton ; Dunham Park, Manchester ; Northumberland and Durham district, on oak wood, rare ; Mr. Blatch informs me that it abounds in Birmingham in ash wood used for spade and other tool handles, gun-stocks, &c., and does immense mischief to both the raw and finished materials ; one manufacturer showed him a pile of handles which had been completely destroyed by the borings of this beetle.

L. brunneus, Steph. (*Xylotrogus brunneus*, Steph.). Closely allied to the preceding, which it much resembles in general appearance, but easily distinguished by the sculpture of the thorax, which is rather coarsely punctured and not granulose, and has the central furrow much less marked and more or less obsolete ; the head also is finely punctured, and not granulose as in *L. canaliculatus* ; the thorax is more widened in front, and the pubescence is more sparing and finer both on this part and on the head, and the rows of hairs on the elytra are less marked ; the antennæ, moreover, are more slender, and terminate in a narrower club. L. 3-5 mm.

In old oak stumps ; occasionally on oak palings ; very rare ; Norwood (S. Stevens) ; Forest Hill (Marsh) ; Brockley ; Dulwich (in wasps' nest, Stephens) ; banks of Lea ; Crystal Palace ; it has also been taken in Oxford Street by Mr. Waterhouse ; Nottingham (one specimen in a shop window).

SPHINDIDÆ.

This small family, which only contains three or four genera and a very few species, is one of the most difficult to locate with any certainty; the tarsi, in the females at least, are heteromorous, and in some respects it bears a relation to certain Tenebrionidæ, and may very probably be finally classed with the Heteromera; its affinities, however, with the Cissidæ and Bostrichidæ are so great that further consideration is necessary before relegating it to that group; in the catalogue of Heyden, Reitter, and Weise it is placed with *Aspidiphorus* as a tribe of the Bostrichidæ, and just before the Lyctidæ; in one or two points, such as the elongate first ventral segment of the abdomen, *Sphindus* appears to agree with *Lyctus*, but *Aspidiphorus* appears rather to belong to the Byrrhidæ; Perris, however, has pointed out that the larvæ of *Sphindus* and *Aspidiphorus* are very closely related, the difference being chiefly one of colour, the former having the thorax black with a central whitish line, and the other segments ornamented with a transverse band interrupted in middle, and the latter having the head alone black, the thorax reddish, and the rest of the body dull white or livid.

Dr. Horn says that the affinities of the family seem to be equally divergent in a Clavicorn and Serricorn direction, and that it seems mostly related to the Cissidæ; perhaps the best position that can be assigned to it is between the Cissidæ and Lyctidæ. The following are some of the chief characters that distinguish the family:—Head short, prolonged in front, antennæ 10-jointed, with the first two joints enlarged and the last three forming a rather strong club, maxillæ with two narrow ciliate lobes; thorax margined at sides; anterior coxal cavities closed; elytra covering abdomen; abdomen with five free ventral segments, the first being longer than those that succeed it; legs moderate, tibiæ arcuate, tarsi shorter than tibiæ, 5-jointed in the male, anterior and middle pair 5-jointed and posterior pair 4-jointed in the female,* the last joint being as long as the others united. The species belonging to the family are very small, and live on small black powdery fungi that grow on trees.

SPHINDUS, Chevrolat.

This genus contains three species, two of which occur in Europe, and the third inhabits North America; our single species is extremely local, and has only been met with in a few localities.

S. dubius, Gyll. Oblong, convex, somewhat depressed on disc, black, with the antennæ and legs ferruginous or reddish-testaceous; head broad, produced before eyes, which are prominent, finely and

* It is possible that, as far as this character is concerned, the sexes should be reversed (cf. *Rhizophagus*); Dr. Horn gives the tarsi of both sexes as heteromorous.

thickly punctured, antennæ short; thorax convex, transverse, very finely punctured, narrowed in front, with sides and base finely margined; scutellum triangular; elytra as broad as thorax, with a tubercle at each shoulder which is usually light-coloured, with rather regular rows of punctures set in fine striæ, interstices very slightly convex and furnished with rows of short whitish hairs; legs rather slender. L. 2 mm.

In powdery fungus, on old fir stumps, and on decaying beech trees; rare; Esher (Power); Cobham Park (Walker); Chatham; Weybridge; New Forest; Cannock Chase (Blatch); Scarborough (Lawson).

CISSIDÆ.

The Cissidæ, or Cioidæ, as they are called by some authors, are in several points closely connected with the Bostrichidæ, and may possibly be regarded as a feeble and depauperized form of that family; they comprise a few genera of small and insignificant insects, which are widely distributed in both tropical and temperate countries, and are found in fungi on old wood, or in decayed wood which is more or less infested with fungoid growth. The following are the chief characters of the family:—Forehead prone, head and front of thorax often horned or furnished with lamellæ in male, antennæ 8–10-jointed, with the last three joints forming a loose club, inserted under the raised margin of the forehead; thorax margined at sides, more or less cylindrical, anterior coxal cavities narrowly closed behind; elytra entirely covering abdomen, the latter composed of five segments, of which the first is longer than the following; tarsi 4-jointed, with joints 1–3 very short, equal, and the last much longer than the remainder taken together; the general form is short and convex, and the upper surface, as a rule, is rather strongly pubescent.

The larvæ of the Cissidæ bear some analogy to those of the Ptinidæ, but differ in having five ocelli on each side of the head, and in the formation of the last segment of the abdomen, as well as in other points; the larva and pupa of *Cis boleti* are well figured by Mellié (Monographie de l'ancien genre *Cis*, Annales de la Société Entomologique de France, 2nd Series, vol. vi., plate 10, fig. 6 and 6a); the larva is fleshy white, cylindrical, rather curved, somewhat broader in front than behind, with the head round, smaller than the prothorax, and the remaining segments of much the same character until the last, which is not longer than the preceding, and bears two rather long spines, which are slightly curved towards the back; the antennæ are short, 3-jointed, and the legs are moderately long; the two spines on the last segment seem to be characteristic of all the species of *Cis*; the pupa also is furnished with a somewhat similar pair of spines, and is rather strongly contracted towards apex; it does not, however, present any further peculiarities that call for particular notice.

Out of the five European genera four are found in Britain; these may be distinguished as follows:—

I. Antennæ 10-jointed.

- i. Anterior coxæ transverse, round oval; tibiæ not (or very rarely) dilated at apex *Cis*, *Latr.*
- ii. Anterior coxæ shorter, more or less conical; tibiæ dilated and denticulate at apex *Rhopalodontus*, *Mell.*

- | | |
|----------------------------------|---------------------------|
| II. Antennæ 9-jointed | ENNEARTHRON, <i>Mell.</i> |
| III. Antennæ 8-jointed | OCTOTEMNUS, <i>Mell.</i> |

CIS, Latreille.

This genus comprises more than a hundred species, of which about forty occur in Europe; the rest are widely distributed, representatives having been recorded from the Atlantic Islands, South Africa, Madagascar, North and South America, Japan, Ceylon, &c.; they are, as a rule, small and obscure insects, but in many cases the clypeus and anterior margin of the thorax are armed in the male with horns or lamellæ which present a very curious appearance; many of the species are very closely allied and are hard to distinguish, the differences often depending on the comparative strength of the punctuation and pubescence; it is obvious, therefore, that a table of species must be more or less unsatisfactory, and the one given below must be regarded as provisional, and must not be trusted without a reference to the detailed descriptions. Thomson divides the genus into separate genera, *Hadraule*, *Eridaulus*, and *Cis*, i. sp., but the distinctions he gives hardly warrant the separation, and they have not been generally adopted.

- I. Thorax uneven, with irregular impressions on disc.
- i. Impressions on thorax rather distinct, base not bordered C. BOLETI, Scop.
(rugulosus, Mell.)
- ii. Impressions on thorax more or less obsolete, base bordered C. VILLOSULUS, Marsh.
- II. Thorax with disc even.
- i. Thorax in male with two strong and projecting teeth on anterior margin; pubescence very scanty C. BIDENTATUS, Ol.
- ii. Thorax of male without, or with obsolete, teeth on anterior margin.
1. Pubescence very scanty, or almost absent; upper surface shiny or very shiny.
- A. Form longer; elytra unevenly punctured.
- a. Size larger; form broader and more depressed; posterior angles of thorax almost right angles C. ALNI, Gyll.
- b. Size smaller; form narrower and more convex; posterior angles of thorax rounded.
- a*. Anterior angles of thorax produced; colour lighter C. NITIDUS, Herbst.
- b*. Anterior angles of thorax not produced; colour darker C. JACQUEMARTI, Mell.
- B. Form very short; elytra strongly and rather evenly punctured in rows C. LINEATOCRIBRATUS, Mell.
2. Pubescence distinct, rendering the upper surface, as a rule, more or less dull.
- A. Elytra rather regularly striate-punctate; form elongate and depressed C. ELONGATULUS, Gyll.

- B. Elytra with larger and smaller punctures, the larger being arranged in rows towards base.
 - a. Thorax with side margins broad . . C. MICANS, *F.*
 - b. Thorax with side margins narrow . C. HISPIDUS, *Payk.*
- C. Elytra uniformly and irregularly punctured, with the punctures not arranged in rows towards base.
 - a. Head and thorax in male without plates.
 - a*. Elytra strongly punctured . . C. PUNCTULATUS, *Gyll.*
 - b*. Elytra comparatively finely or very finely punctured.
 - a†. Posterior angles of thorax almost right angles . . . C. PYGMÆUS, *Marsh.*
 - b†. Posterior angles of thorax rounded.
 - a‡. Elytra more shiny, less closely punctured.
 - *. Form broader and more convex; thorax less contracted in front . . . C. FESTIVUS, *Panz.*
 - **. Form narrower and more depressed; thorax more contracted in front . . . C. VESTITUS, *Mell.*
 - b‡. Elytra duller, more closely punctured . . . C. FUSCATUS, *Mell.*
 - b. Clypeus and anterior margin of thorax each furnished in male with a broad oblong projecting plate . . C. BILAMELLATUS, *Wood.*

C. boleti, Scop. (*rugulosus*, Mell.). The largest of our species; oblong, very convex, of a dark pitchy brown colour, but varying from this to ferruginous, immature examples being sometimes quite light; upper surface clothed with very fine, almost scale-like, greyish-yellow pubescence; thorax as broad as long, at least as broad as elytra, rather strongly margined at sides, but without or with scarcely a trace of a margin at base, sides slightly rounded, very finely and closely punctured, disc uneven and with more or less distinct traces of a raised central line; elytra very finely and thickly and more or less rugosely punctured with large coarse punctures, which are arranged in more or less irregular rows; antennæ and legs ferruginous, the former with club sometimes darker. L. 3-4 mm.

Male with the forehead transversely impressed in middle, and the clypeus emarginate at apex in middle, and furnished on each side with a blunt tooth; thorax slightly broader than elytra.

Female with the forehead almost even, and the clypeus simple; thorax not broader than elytra.

In *boleti*, especially *Polyperi*, on the bark of rotten trees; also in damp fungoid wood; generally distributed throughout the kingdom, and usually abundant.

The *Cis rugulosus* of Mellié, which was introduced into our lists by

Mr. Crotch, appears to be only a variety of *C. boleti*, in which the rugose punctuation of the elytra is more apparent, and the larger punctures more or less obsolete; as intermediate variations occur, it can hardly be regarded as a stable variety, much less as a species.

C. villosulus, Marsh. (*setiger*, Mell.; *plagiatus*, Thoms.). Very like the preceding, but smaller and narrower, with the base of the thorax margined, and the impressions on its disc, as a rule, more obsolete; the colour as a rule is lighter, and the pubescence of the elytra is distinctly stronger and more sparing, and also longer; the general form is said to be less convex and the side margins of the thorax less pronounced, but, in some specimens at all events these are not marked characters; the femora are nigro-fuscous at base. L. $2\frac{1}{2}$ –3 mm.

In *boleti* and fungoid growth; often under bark of willows, &c.; locally common; London district, common and generally distributed; Dover; Glanvilles Wootton; Needwood, Staffordshire; Repton, Burton-on-Trent; Dunham Park, Manchester (in *boleti* on beech), and Stretford; it has not been recorded from the northern counties or from Scotland.

C. micans, F. (*pyrrocephalus*, Marsh.). Oblong, convex, fuscous black or fuscous (in immature specimens lighter), clothed with fine and regular short greyish pubescence, with the antennæ and legs ferruginous, the former with the club always dark in mature examples; thorax with disc even, a little broader than long, finely, thickly, and rather regularly punctured, but not rugose, anterior margin slightly produced, side margins rather broad, posterior angles right angles; elytra more than twice as long as thorax, finely, rather thickly, and rugosely punctured, with large punctures intermingled, which are arranged in more or less distinct rows towards base. L. 2–3 mm.

Male with the forehead impressed and the clypeus emarginate in middle at apex, and furnished on each side with a blunt tooth.

In *boleti*, &c.; local, and, as a rule, not common; London district, not common, Mickleham, Reigate, Forest Hill, Hawkhurst, Chatham, Gravesend, Farnham, West Wickham, Loughton, Rusper; South Devon; Yardley and Knowle, near Birmingham; Repton; Sherwood Forest.

C. hispidus, Payk. This species is very closely allied to the preceding, and by some authors, apparently, is considered identical with it; it may, however, be known by the evidently narrower margins of the thorax; the pubescence is also longer, and the antennæ are red, with the club not darker as in *C. micans*; this latter character, which was pointed out to me by Dr. Power, seems to be of great use in distinguishing mature specimens of the two species; mistakes may of course arise with immature ones. L. 2–3 mm.

In *boleti*, &c.; local, but commoner than the preceding; London district, Kent and Surrey, not uncommon, and apparently generally distributed; Essex; Devon; Windsor; Malvern; Bewdley; Cannock Chase; Knowle; Sherwood Forest; Repton; neither this nor the preceding species have occurred further north than the Midlands.

C. bidentatus, Ol. Oblong, convex, very scantily pubescent, pitchy black; antennæ ferruginous; thorax convex, broader than long, produced on anterior margin, with sides and base finely bordered, closely and finely, but distinctly and not rugosely punctured, posterior angles obtuse; elytra as broad and twice as long as thorax, regularly and distinctly punctured; legs ferruginous. L. $2\frac{1}{2}$ mm.

Male with the clypeus bidentate at apex, and with the thorax sinuate at apex on anterior margin, and furnished on each side of the sinuation with a distinct strong tooth.

In boleti on old trees; also in decayed stumps; rather local, but not uncommon; London district, common; New Forest; Glanvilles Wootton; Devon; Somerset; Worcester; Salford Priors; Cannock Chase; Cambridge; Repton; Sherwood Forest; Nocton, near Lincoln; Scarborough; Northumberland and Durham district; Scotland, local in *Polypori*, Clyde, Tay, and Moray districts; it probably occurs not uncommonly in Ireland.

C. alni, Gyll. (*betulae*, Zett.). Elongate, shining, rather depressed on disc, with very scanty pubescence, almost glabrous, of a dark pitchy brown colour, often inclining to castaneous; antennæ ferruginous, with the club darker; thorax as long as, or a little longer than, broad, with sides slightly rounded and rather finely, but very distinctly margined, posterior angles obtuse, but well marked, upper surface closely but distinctly punctured, with traces of a central channel often apparent; the front part of the thorax is often lighter than the rest of the body; elytra rather long, two and a half times as long as thorax, usually with a lighter patch at shoulders and another behind middle, distinctly and regularly and not very closely punctured; legs pitchy red or ferruginous with the femora rather darker. L. $2-2\frac{3}{4}$ mm.

In boleti on old stumps, &c.; occasionally by sweeping; as a rule rare, but not uncommon in a few localities; London district, Darenth, Hawkhurst, Caterham, Reigate; New Forest; Mount Edgecumbe Park, Plymouth; Quy Fen, Cambridge, bred by Dr. Power; Littlington; Cannock Chase; Needwood Forest; Dunham Park, Manchester, on decayed oak; Scotland, very rare, Tay and Dee districts (Rannoch, &c.).

C. nitidus, Herbst. (*Eridaulus nitidus*, Thoms.). A small short and very convex species, shining, almost glabrous, of a pitchy brown colour, inclining to castaneous; head very finely punctured, antennæ red with the club dark; thorax a little broader than long, with anterior angles acute and somewhat thickened, and the sides and base finely margined, posterior angles rounded, upper surface finely but not very thickly punctured with traces of a smooth central line; elytra as broad and twice as long as thorax, rather coarsely and shallowly punctured, and with an intermixture of fine punctuation; legs testaceous. L. $1\frac{1}{2}-1\frac{3}{5}$ mm.

Male with the clypeus emarginate at apex, and produced on each side in a small tooth.

In boleti, also in old stumps, fallen boughs, &c.; locally common; Chatham, Rich-

mond Park, Birdbrook, Sanderstead, Addington, Claygate, Tonbridge, Bearsted, New Forest; Glanvilles Wootton; Devon; Nettlecomb, Somerset; Windsor; Nocton, near Lincoln; Scotland, Tay district; Ireland, near Dublin.

C. Jacquemarti, Mell. This species is very closely allied to the preceding, which it much resembles in structure and sculpture, but it may easily be known by the shape of the anterior angles of the thorax, which are rounded and not produced as in *C. nitidus*; the general form is narrower and more elongate, and the colour, as a rule, appears to be darker; the examples that have been taken in Britain are almost black, but lighter examples occur, apparently, on the Continent; the antennæ and legs are testaceous; the teeth on each side of the clypeus of the male are sharper than in the preceding species. L. $1\frac{1}{2}$ – $1\frac{3}{4}$ mm.

In *Polypori*; very local and not common; Scotland, Tay and Dee districts.

C. lineatocribratus, Mell. A very small and distinct species, short and cylindrical, convex, almost glabrous, shining, of a lighter or darker brownish-yellow or reddish-yellow colour; antennæ and legs yellow; thorax about as long as broad, convex, very finely punctured, with the sides and posterior angles rounded and the anterior angles blunt; elytra short, being only one and a half times as long as thorax, with plain and regular rows of rather large punctures, interstices finely punctured; the rather long thorax and short elytra, together with the sculpture of the latter, will at once distinguish the species. L. $1\frac{1}{4}$ – $1\frac{1}{2}$ mm.

Male with the clypeus emarginate at apex, and furnished with a tooth on each side.

In *Polyporus nigrinus* on birch; very local, but not uncommon where it occurs; Scotland, Tay and Moray districts (Rannoch and Forres).

C. elongatulus, Gyll. (*Hadraule elongatula*, Thoms.). Elongate, parallel-sided, rather depressed, clothed with short pubescence, moderately shiny, of a fuscous black colour; antennæ reddish-yellow, with the club darker; thorax broader than long, not narrowed in front, with the sides slightly rounded and all the angles blunt, upper surface very finely punctured; elytra three times as long as thorax, parallel, with rather regular rows of punctures, interstices with rows of short pilose hairs; legs reddish-yellow. L. 2 mm.

In boleti, &c.; very rare; recorded by Mr. Crotch from Scotland, and by Mr. Blatch from Knowle, near Birmingham; it appears to be a rare species on the Continent.

C. punctulatus, Gyll. Elongate, cylindrical, moderately shiny of a fuscous black or fuscous brown colour, clothed with long, erect, pale pubescence; antennæ yellowish, with the club scarcely darker; thorax as long as broad, very finely punctured, with the sides very slightly rounded, almost straight, and with the angles almost right angles; the anterior margin projects rather strongly over the head, and

the side border is very fine; elytra long, two and a half times as long as thorax, closely, strongly, and irregularly punctured, with rather long pubescence; legs testaceous. L. $2\frac{1}{2}$ mm.

Male with the clypeus emarginate at apex, and a small tooth at each side of the emargination.

In *Polyporus abietinus* on Scotch fir; rare; Scotland, Forth, Tay, Dee, and Moray districts (Braemar, Aviemore, &c.); Dr. Power has found it in some numbers at Balmuto, Fifeshire, under bark of larch.

This species may easily be known from all our other species of *Cis* by the punctuation and pubescence of the elytra.

C. pygmæus, Marsh. (*oblongus*, Mell.). Elongate, cylindrical, black or fuscous black, moderately shiny, clothed with rather strongly marked and somewhat long shining greyish pubescence; antennæ testaceous or light ferruginous; thorax broader than long, a little narrowed in front, with the sides and base finely margined, anterior angles obtuse, posterior angles almost right angles, upper surface evenly and very finely punctured; elytra two and a half times as long as thorax, finely and thickly punctured; legs ferruginous, with the femora and part of the tibiæ often darker. L. $1\frac{3}{4}$ – $2\frac{1}{2}$ mm.

Male with the clypeus furnished with a tooth or tubercle on each side.

In boleti; also on old stumps, and by beating old trees; not common; Chatham, Forest Hill, Horsell, Coombe Wood, Dulwich, Tonbridge; New Forest; Windsor; Reading; Knowle, near Birmingham.

By some authors this species is compared with *C. alni*, but it is darker and more convex, more strongly pubescent, and more closely and finely punctured; it is, apparently, very variable in size.

C. festivus, Panz. Oblong, cylindrical, moderately shiny, of an obscurely ferruginous colour, sometimes brown or pitchy brown, clothed with rather short and close yellowish pubescence; antennæ reddish; thorax broader than long, finely punctured and pubescent, with the sides slightly rounded, and plainly margined (a character that will distinguish it from the allied species), anterior angles blunt and not projecting, posterior angles obtuse or slightly rounded; elytra twice as long as thorax, not very closely and rather distinctly punctured, with the interstices very finely rugose; legs ferruginous. L. 1–2 mm.

Male with the clypeus armed with two small erect tubercles placed near one another, and with the thorax almost broader than elytra.

In boleti, &c.; also in decaying wood, especially fallen boughs; not common; Chatham, Caterham, Mickleham, Shirley, Whitstable, Esher, Cowfold; Ulting, Essex; South Devon; Leicestershire; Northumberland and Durham district, Ravensworth, Wallington, Seghill Dene, and by the Irthing; Scotland, not common, Tweed, Tay, and Dee districts.

C. vestitus, Mell. Allied to the preceding, and closely resembling

it in general appearance and colour; it is, however, smaller, narrower and flatter, with the margins of the thorax narrower, and the sides of the same more contracted in front, and it may also be known by its more closely punctured elytra; the antennæ, moreover, are darker, especially towards apex; the male has the clypeus furnished with two tubercles; as regards punctuation the species appears to be intermediate between *C. festivus* and *C. fuscatus*. L. $1-1\frac{3}{4}$ mm.

In boleti, &c.; rare; Forest Hill, Surrey (Marsh); Dulwich; Olton and Sutton Park, near Birmingham; Repton; Dunham Park and other localities near Manchester; Teesdale.

C. fuscatus, Mell. (*castaneus*, Mell.; *fagi*, Waltl.). Rather elongate and narrow, somewhat depressed on disc, ferruginous or brownish-red, clothed with greyish pubescence; antennæ red, with the club sometimes darker; thorax about as long as broad, with the sides narrowly bordered, and all the angles obtuse or rounded, finely punctured; elytra two and a half times as long as thorax, closely and finely punctured; legs ferruginous. L. $1-1\frac{1}{2}$ mm.

Male with the clypeus armed with two tubercles.

In boleti, fungoid growth on trees, &c.; local; Highgate; Richmond Park; Chertsey; New Forest; Cannock Chase; Shrewsbury; Church Stretton; Sherwood Forest; Dunham Park, Manchester.

The narrow depressed form, and fine punctuation, will serve to separate this species from its allies.

C. bilamellatus, Wood. Oblong, rather short and broad, sub-cylindrical, of a fuscous or fusco-testaceous colour, scantily clothed with yellow pubescence; head slightly rugose, with the eyes prominent, antennæ yellow, with the club blackish; thorax closely and finely punctured with the spaces between the punctures very finely rugose, sides finely margined, posterior angles rounded; at the base there is a trace of a smooth central line; elytra about twice as long as thorax, rather broad, subparallel, closely but distinctly sculptured, broadly and bluntly rounded at apex; legs testaceous. L. $1\frac{1}{2}-2$ mm.

Male with the clypeus produced into a broad upright plate which is somewhat recurved at apex, and with the thorax subquadrate, narrowed in front, and with the anterior margin produced into a broad upright plate, similar to that on clypeus, but not recurved at apex.

Female with the thorax longer than broad, with the sides less rounded and more gradually contracted in front than in male; clypeus and thorax without plates.

In boleti and under bark; on pine, birch, and ash; very local; taken in profusion at West Wickham Wood, near London, by Mr. T. Wood in 1884; it has not, however, been recorded from any other locality, either British or foreign; Mr. Wood has remarked that in the male pupa the lamellæ on the clypeus and thorax are as conspicuous as in the imago.

RHOPALODONTUS, Mellié.

This genus contains five European species, which are distinguished from *Cis* by the shape of the anterior tibiae, and by having the tibiae dilated and denticulate at apex; some authors have assigned *R. fronticornis* to the genus *Ennearthron*, believing the antennæ to be 9-jointed; the three joints preceding the club are very small, and a mistake might be made if a low magnifying power were used, or under certain lights; I have, however, carefully examined several specimens, and they are plainly 10-jointed, the first two joints being large and inflated, the next two elongate but much more slender, the following three minute and transverse, but very distinct, and the last three forming a well-marked club.

- I. Size larger; punctuation of elytra very coarse . . . *R. PERFORATUS*, Gyll.
 II. Size smaller; punctuation of upper surface fine . . . *R. FRONTICORNIS*, Panz.

R. perforatus, Gyll. (*punctiger*, Walzl.). Oblong, short, broad and robust, cylindrical, parallel-sided, of a lighter or darker pitchy brown colour, rather scantily clothed with long pubescence; antennæ testaceous; thorax broader than long, convex, rather dull, finely margined, with the sides and hinder angles rounded, upper surface finely and closely, but rather distinctly punctured; elytra as broad and twice as long as thorax, and of a lighter colour, short and cylindrical, with very coarse and strong punctuation, the punctures being large and round, and arranged in more or less distinct rows, and with a sutural stria at apex; under-side finely and thickly punctured; legs yellow. L. $1\frac{3}{4}$ –2 mm.

In fungi; very rare; Scotland, Highlands, Tay district; it was first discovered in Britain by James Foxcroft, who reared it from boleti gathered by him from old birch trees in the Black Forest, near Rannoch, Perthshire, and it was afterwards taken by Turner in the same locality.

The short broad form, very coarsely punctured elytra, and long pubescence will at once distinguish this species from all our other Cissidæ.

R. fronticornis, Panz. A small and rather narrow species, oblong, convex, not very shiny, black or pitchy black, sometimes lighter; clothed with fine and even pubescence; antennæ testaceous with club darker; thorax about as long as broad, or very slightly transverse, very finely punctured, with the sides finely margined, and the angles obtuse or rounded; elytra less closely punctured than thorax, as a rule lighter at apex; legs testaceous. L. $1-1\frac{1}{3}$ mm.

Male with two erect small horns on clypeus, and with the anterior margin of thorax emarginate at apex, and produced into a minute tubercle or horn on each side of the emargination.

In fungi; on old willows; very local, and, as a rule, rare; Weybridge, Claygate, and Cowley (Power).

ENNEARTHRON, Mellié. (*Entypus*, Redt.)

According to the Munich catalogue this genus contains thirteen species, two from Europe, and the remainder from North and South America, Cuba, and South Africa; several European species have, however, been described since, and the genus is probably a much more extensive one than is at present known; in fact, this is probably the case with all the genera belonging to the family, as, from their minute size and inconspicuous appearance, they are often passed over by collectors; they are distinguished by their 9-jointed antennæ, of which the first two joints are large, the third slender and elongate, the next three very small, and the last three form a large and distinct club.

- I. Colour pitchy black; pubescence more scanty; punctuation less strong *E. AFFINE*, Gyll.
 II. Colour reddish-brown; pubescence thicker; punctuation stronger *E. CORNUTUM*, Gyll.

E. affine, Gyll. Oblong, subcylindrical, convex, black or pitchy black, rather shining, clothed with rather scanty erect whitish hairs, which are arranged in rows on the elytra; head rather large, very finely punctured; antennæ testaceous, with the club dark; thorax as long as broad, thickly and very finely punctured with traces of a smooth central line, sides and base very finely bordered, angles rounded; elytra twice as long as thorax, and more strongly and rather distinctly punctured; legs ferruginous, with the femora often infusate, tibiæ denticulate at apex. L. $1-1\frac{1}{2}$ mm.

Male with the clypeus furnished with two minute sharp horns, and the thorax slightly broader than elytra.

In boleti, on old stumps, &c.; locally common; common in the London district, and in Kent and Surrey generally, Chatham, Sheerness, Darent, Ripley, Ashted, Birch Wood, Farnham, Bearsted; Loughton and Debden Green, Essex; St. Leonard's Forest; New Forest; it has also been recorded from Scarborough, but this is the only record from any but the London, South-eastern, and Southern districts.

E. cornutum, Gyll. Larger than the preceding, on an average, somewhat obovate, convex, rather shining, of a ferruginous colour, scantily clothed with greyish pubescence, which, on the elytra, is arranged in more or less distinct rows; head finely punctured, antennæ ferruginous, pubescent, with the club rather darker; thorax convex, about as long as broad, somewhat narrowed in front, with the sides slightly rounded, and the sides and base margined, anterior angles obtuse, posterior angles rounded, upper surface rather finely and thickly punctured; elytra twice as long as thorax, slightly widened behind, with rather strong and not very close punctuation; legs yellow. L. $1-1\frac{3}{4}$ mm.

Male with the clypeus bidentate at apex, and with the thorax

deeply emarginate in front, and produced into a small sharp horn at each side of the emargination; the thorax also is broader than in the female.

In fungoid growth on trees; local, and, as a rule, not common; Caterham, Richmond Park, Esher, Chatham, Sheerness, Hawkhurst, Darenth Wood, Highgate, Chertsey, Loughton, West Wickham (where Mr. T. Wood has taken it commonly); Hastings; St. Leonard's Forest; New Forest; Robins Wood, near Repton, Burton-on-Trent; Dunham Park, Manchester.

OCTOTEMNUS, Mellié. (*Orophius*, Redtenbacher.)

This genus, if we include under it the species of *Orophius*, which appears only to differ from it materially in its largely developed and prolonged mandibles, contains three or four species, which occur in Europe, Madeira, and Japan; they are distinguished by their 8-jointed antennæ, of which the first two joints are large, the third elongate and slender, the fourth and fifth small, the last three being dilated and forming a well-marked club; the anterior tibiæ are also finely denticulate or spinose externally for their whole length; our single species is very shining, almost glabrous, and very finely and more or less obsoletely punctured; it is one of the commonest of our species of Cissidæ.

O. glabriculus, Gyll. A small, short, convex species, with the sides somewhat rounded, glabrous and shining, of a lighter or darker castaneous brown colour; head finely punctured, with the mandibles slightly projecting, unequal, the left one being larger than the right; antennæ yellow; thorax as long as broad, narrowed in front, very finely punctured, with the angles rounded; elytra very convex and shining, with fine and somewhat rugose punctuation, which is, however, stronger than that of thorax, and with a fine sutural stria; legs yellow. L. $1-1\frac{1}{2}$ mm.

In boleti on old stumps, &c.; common and generally distributed throughout the greater part of England and Wales and Ireland; Scotland, in *Polypori*, local, Forth and Moray districts.

The species much resembles *Cis nitidus* in general appearance, but may easily be known (apart from the 8-jointed antennæ) by the shape of the thorax which is distinctly narrowed in front, and by the finer sculpture of the elytra.

LONGICORNIA.

This group is one of the largest and most important of the whole of the Coleoptera; in the Munich catalogue, published in 1872-73, some hundreds of genera and upwards of eight thousand species are enumerated, and the supplement published by M. Lameere in 1883 contains the names of two hundred new genera and fourteen hundred new species,

or about a fifth of the whole number previously known; since the latter year a considerable number have been described, and a large number of new genera and species will be found enumerated in the Zoological Records for the last four years as described by Mr. H. W. Bates in the *Biologia Centrali-Americana*, and by other authors; it is not, perhaps, that these insects are more numerous than those belonging to more obscure groups, but they are so conspicuous by reason of their large and elegant shape and colouring and their very long antennæ that they are much more likely to be seen by an ordinary observer, and are among the insects that are most frequently brought to collectors in tropical countries by natives sent out to search for objects of natural history, who, unless trained, are almost certain to neglect the less conspicuous forms.

By far the largest number of the species belonging to the group are found in the tropics, and, as the larvæ are invariably wood-feeders, it is obvious that those districts will be most rich in members of the group which are most thickly clothed with virgin forests, and probably no other portion of the world contains a larger number than the densely-timbered Amazon basin; in these great forests the Longicornia play a very important part in the economy of nature; as soon as a tree dies and begins to decay, their larvæ, which are very often of great size, attack it and bore it through and through; the work of boring from their large galleries is then taken up by various smaller species of wood-boring Coleoptera, and free access is thus given to the rain and moisture, which soon reduce the trunks to a pulp, and cause them not only to disappear, but to act as manure to those trees that take their places; were it not for the agency of these insects, the forests, in course of time, would be blocked up and gradually disappear.

The following are the chief characteristics of the group:—Form elongate, usually more or less depressed, with the elytra almost always broader than the thorax, usually considerably so; head variable, eyes, as a rule, emarginate, rarely entire, sometimes entirely divided; antennæ usually very long, but occasionally (e.g. in *Rhagium*) short, inserted either in front of or between the eyes, not clavate, filiform or setaceous, rarely serrate or pectinate, in exotic genera occasionally ornamented with brushes of hair; maxillæ with two lobes, one being occasionally obsolete, mandibles strong, labial palpi 3-jointed; thorax rarely margined, sometimes denticulate at sides; elytra, as a rule, covering abdomen, but sometimes abbreviated; abdomen composed of five free ventral segments, a sixth being sometimes visible; legs variable, sometimes rather short and stout, sometimes very long and slender, femora often clavate, tibiæ generally furnished with spurs at apex; tarsi pseudo-tetramerus, 5-jointed, but with the fourth joint very small and connate with the fifth, which is slender, third joint bilobed, joints 1–3 (except sometimes on the posterior pairs) usually furnished with thick pubescence underneath (which, however, is sometimes absent on the

first and second joints of the posterior tarsi), claws almost always simple, but rarely cleft or appendiculate. The colouring of the species is very variable, and in some of the exotic species is very handsome ; it appears, however, to be rarely metallic.

The Longicornia are closely connected with the Chrysomelidæ, and although no one is likely to confuse the members of the two groups, yet the difference between them is hardly capable of being expressed satisfactorily in words. Dr. Horn (Classification of the Coleoptera of North America, p. 269) says that "so far the essential difference between the Tetramera, of which the larvæ feed upon wood, and those feeding upon cellular vegetable tissues, has eluded observation. We can merely at present observe that a slight approximation to it seems to be made in the fact, that in the Cerambycidæ there is a tendency in the epimera of the metathorax to extend to the sides of the ventral segments, while in the Chrysomelidæ the first ventral segment is prolonged forwards at the sides to meet the metathorax, thus showing probably a lower, though necessarily more recent type, which could have existed only since the development of the higher broad-leaved plants."

The members of this group, owing to their habits of life in the larval state, are probably among the most archaic of the Coleoptera ; they can live a long time within the trunks of trees in which they take up their abode, even if they are immersed in water, and are, of course, to a great extent protected against external enemies ; the chief collector and describer of the group, Mr. H. W. Bates, in commenting upon the vast amount of different forms belonging to the family, remarks as follows : *— "It is one of those groups of insects in which nature, in striving after strong individuality in the species, seems to have changed or adapted those parts of structure upon which we rely for characters of genera and groups of genera. The family, too, is found throughout all parts of the world where woody vegetation exists, and has endured, probably, under the same laws of modification, throughout long geological periods. The diversity of specific forms seems endless, running into infinite varieties of grotesque, ornamented, and extraordinary shapes ; and nearly every species has structural peculiarities for its specific characters ; so that in no family can genera be made so easily and numerously as here. Analysis is too easy, and has already been pushed, perhaps, to too great an extent."

The larvæ of the Longicornia are large fleshy insects, which, as a rule, but not always, have the prothorax much enlarged in comparison with the succeeding segments, and are more or less gradually narrowed behind ; the meso- and metathorax are often very short ; the abdominal segments are nine in number, and the anal segment is rounded and continuous with the body, presenting the appearance of a tenth segment ; the head is corneous and depressed, armed with

* Contributions to an Insect Fauna of the Amazon Valley. Coleoptera, Longicornes. Part I., Lamiaires, pp. 5-6. (Annals and Magazine of Natural History, 1861.)

strong wedge-shaped mandibles, antennæ extremely short, 4-jointed; upper and lower surface of segments usually protected by scuta, and, as a rule, furnished with fleshy tubercles which are capable of protrusion and aid locomotion; legs very short; the larvæ are usually of a dirty-white colour; they undergo their transformations within the trunks of various trees, the eggs being deposited beneath the bark by the females, which possess a strong corneous ovipositor that is capable of being considerably protruded.

Many of the species have the power of stridulating; the thorax, where it joins the elytra, is fitted over a sort of short neck before scutellum; it is on the sides or front of this that the stridulatory organ appears usually to be situated, and the sound is produced by the friction of the inner side of the hinder margin of the thorax against this surface. I have noticed the sound particularly in *Agapanthia lineatocollis*; by moving the head up and down, the sound may be produced as loudly in dead specimens that are fresh as in living ones; in the *Prionina* certain species produce a sound by rubbing the hind femora against the edge of the elytra. A number of species have also the faculty of emitting a strong and distinct smell, sometimes agreeable as in *Aromia moschata*, the well-known "Musk Beetle," sometimes the reverse as in *Agapanthia lineatocollis*, in which it resembles the smothering smell of a candle which has been blown out and left to smoulder; according to Dr. Horn the episterna of the metasternum is variable, and near its inner hind angle the duct for the scent gland is situated.

As might be gathered from what has been before said, the number of genera and species found in Europe is very meagre compared with those found in tropical countries, the total only amounting to one hundred genera and about four hundred and seventy species; of these, no less than eighty-six species are contained in the single genus *Dorcadion*, which in Europe is confined to the southern countries, and is not represented in Britain; of these, twenty-eight genera, represented by fifty-eight species, are recorded as British, but some five or six of these latter are doubtfully indigenous; in Scotland only fifteen genera and twenty-three species have hitherto been discovered; it is obvious, therefore, that we possess only a few outlying fragments of this large and important group, and that in dealing with our fauna it is useless to discuss the classification of the genera, further than just to mention their principal characters.

The Longicornia may be divided into the three following families:—

- I. Prosternum considerably produced in a blunt process behind anterior coxæ; thorax margined, with the sides armed with spines or teeth; labrum very small, usually connate with clypeus . . . PRIONIDÆ.
- II. Prosternum not or scarcely produced behind anterior coxæ; thorax not margined, with the sides sometimes armed with spines and teeth, but usually simple in our species; labrum free and distinct.
 - i. Anterior tibiæ not grooved on their inner side . . . CERAMBYCIDÆ.
 - ii. Anterior tibiæ grooved obliquely on their inner side . . . LAMIIDÆ.

PRIONIDÆ.

This family contains upwards of two hundred genera and a large number of species; in Europe, however, only half-a-dozen genera, represented by eight species, have been discovered; of these one species only is found in Britain; it is, however, one of our most conspicuous insects; the *Prionidæ* contain some of the largest of the Coleoptera; they are distinguished by their connate and obsolete labrum, margined thorax, and produced prosternum; the anterior coxæ are transverse and distant, with the cavities open behind, and are furnished with linear trochantins; the mandibles are strong, incurved at apex; the thorax is somewhat indistinctly margined, and is strongly spined at sides; the femora are long and not clavate; the general form is large and more or less depressed, the elytra being as a rule somewhat coriaceous in appearance; the first segment of the abdomen is not or scarcely longer than the second; the first three joints of the tarsi are broad, and are strongly pubescent on their under-side.

PRIONUS, Geoffroy.

This genus contains about thirty species, which are rather widely distributed, species occurring in Siberia, China, Japan, and Central Asia, and also in North America from Canada southwards, and the Australian region; it does not appear to be a tropical genus; three species are found in Europe.

The transformations of *P. coriarius* are figured and described by Rösel, quoted by Westwood (Classification, i. 362); the larva is of a white colour, broad and rather flat, and gradually and somewhat strongly narrowed towards apex; the head is moderately large, and is capable of being considerably retracted into the prothorax, which is large, being longer than the meso- and metathorax together; the mandibles are very strong and powerful; the ocelli are obsolete; the legs and antennæ are very short; the abdominal segments are furnished with fleshy tubercles which are used for locomotion; the anal appendage is simple. When full fed this larva forms a large cocoon, chiefly composed of chips of gnawed wood, in which it passes the pupal state; before changing it bores its hole close towards the outer surface of the tree, that the perfect insect may easily make its escape; it is found in oak, beech, horse-chestnut, ash, &c.

P. coriarius, L. A very large and conspicuous species, oblong, rather depressed, slightly shiny, without pubescence on upper side, of a pitchy black or dark pitchy brown colour, under-side usually more or less castaneous, with the breast rather densely pubescent; head rather small, with strong projecting mandibles, eyes transverse, not strongly emarginate, antennæ long and robust and strongly serrate in the males, shorter and less serrate in the females; thorax transverse, sinuate at base, much narrower than elytra, spined at sides, rugosely punctured; scutel-

lum rounded behind; elytra broad, rugosely punctured, with obsolete traces of raised lines, indistinctly mucronate at sutural angles; legs rather long and stout, femora and tibiæ compressed. L. 25–38 mm.

Male with the antennæ distinctly 12-jointed, longer, more robust, and more strongly serrate, abdomen pubescent, fifth segment depressed and slightly emarginate at apex.

Female with the antennæ 11-jointed, the last joint being obsolete 3-jointed, shorter and less strongly serrate, abdomen glabrous, fifth segment very slightly emarginate at apex.

In decaying trees; on fennel, &c.; occasionally taken on the wing; local, and as a rule not common, but occasionally abundant; Richmond Park, Oakland Park, Coombe Wood, Sevenoaks, Haslemere, Belvedere, Tonbridge; Windsor Forest*; Loughton, Essex; Colchester; Cambridge; Hertford; Shipley, near Horsham; Hastings; Folkestone; Arundel, once in abundance in an old tree (S. Stevens); New Forest; Devon (not uncommon at the roots of old oaks in winter); Swansea; Llangollen; Aston, near Birmingham; Cannock Chase; Dunham Park and Stretford, near Manchester. The Rev. C. T. Cruttwell informs me that he found the species flying in swarms on a hot damp evening early in July, 1873, on the edges of Shotter Mill Wood, near Haslemere; he did not see any flying on any other evening, but on that occasion they were as numerous as cockchafers in early summer. Mr. Parfit records the capture of a female which contained 162 eggs, which filled the entire abdomen; these eggs are somewhat cylindrical, but taper slightly towards one end; they are rather thickly punctured all over with two sets of punctures, the interstices between the larger being filled with minute punctures, the whole being smooth and somewhat polished; their length is from $3\frac{1}{2}$ to 4 mm.

CERAMBYCIDÆ.

This family contains a very large number of genera and species, which are distinguished from the Prionidæ by not having the thorax margined or the prosternum produced behind the anterior coxæ, and by the free and distinct labrum; from the Lamiidæ they may be known by not having the tibiæ grooved on their inner side, and, as a rule, by having the last joint of the palpi truncate and never acute at the tip; the family is by some authors separated from the Lepturidæ, but it seems the best course to regard the *Cerambycina* and *Lepturina* as tribes of one family; by many authors the term Cerambycidæ is applied to the whole group of the Longicornia. In the last European catalogue, Heyden, Reitter, and Weise adopt this plan, and divide the group into two series, the Anaulacnemitæ (containing the *Parandrini*, *Spondyliini*, *Prionini*, *Lepturini*, and *Cerambycini*) and the Metaulacnemitæ (containing the *Lamiini*); this appears, however, to be only carrying the distinction of the grooved tibiæ a little further, and it is hardly worth while to upset the old arrangement. The Cerambycidæ, as arranged in this work, are represented in Europe by considerably more species than the Lamiidæ; the two tribes may be distinguished as follows: the differences, however, are not very striking in many cases:—

* Mr. J. C. Bowring has taken several specimens this summer (1889) in this locality, all of which “emerged from roots of oak trees running along the ground, leaving holes like those of bees’ nests.”

- I. Clypeus shorter; anterior coxæ subglobose, not or only slightly prominent; eyes nearly always strongly emarginate CERAMBYCINA.
 II. Clypeus longer, often subquadrate; anterior coxæ conical, strongly prominent; eyes almost entire or feebly emarginate (in our genera) LEPTURINA.

CERAMBYCINA.

This family is represented in Europe by thirty-eight genera and about one hundred and thirty species; only eight genera and fourteen species are found in Britain; the formation of the clypeus and the anterior coxæ seem to be the chief characters which distinguish them from the succeeding tribe; our genera may be separated as follows:—

- I. Thorax with strong lateral spines AROMIA, *Serv.*
 II. Thorax without lateral spines.
 i. Anterior coxal cavities open behind.
 1. Antennæ inserted just above base of mandibles; femora not or scarcely clavate; form stout and robust ASEMUM, *Esch.*
 2. Antennæ inserted at some distance from base of mandibles; femora more or less distinctly and strongly clavate, and often strongly petiolate.
 A. Anterior coxæ widely separated HYLOTRUPES, *Serv.*
 B. Anterior coxæ contiguous or almost contiguous.
 a. Third joint of antennæ evidently longer than fourth; thorax scarcely, if at all, longer than broad; size larger.
 a*. Anterior coxal cavities rounded, not angulated externally CALLIDIUM, *F.*
 b*. Anterior coxal cavities transverse, very strongly angulated externally CLYTUS, *Laich.*
 b. Third joint of antennæ almost shorter than fourth; thorax plainly longer than broad, subcylindrical; size very small GRACILIA, *Serv.*
 ii. Anterior coxal cavities closed behind.
 1. Abdomen with the first segment elongate; elytra covering abdomen OBRIUM, *Latr.*
 2. Abdomen with the first segment not elongate; elytra abbreviated MOLORCHUS, *F.*

AROMIA, Serville.

This genus contains one species, which is widely distributed in Europe, and is not uncommon on willows in various parts of Britain; it is remarkable for the strong-scented odour which it emits, on account of which it is called the "musk beetle;" this name, however, is erroneous, as the fragrance is much sharper and pleasanter than musk, to which, in fact, it bears very little resemblance; it is the only member of the sweet scent-emitting group that is found in Britain; the allied genus *Calli-chroma* contains a large number of exotic species, in some of which the odour is very strong; it is apparently more or less of a sexual character, and exercises a mutually attractive power, as it is present in both sexes, although it is believed, as a rule, to be more powerful in the female.

A. moschata, L. (*rosarum*, Luc.). A large and fine species, which may be at once recognized by its large size, bright metallic-green colour, and the strong spine on each side of the thorax; the colour is sometimes more or less coppery or bluish; head narrower than thorax, rugosely punctured; thorax transverse, uneven, more or less rugosely punctured, with the disc sometimes almost smooth or sparingly punctured in the female; elytra dull, closely and rugosely punctured, bluntly rounded at apex, with obsolete raised lines; legs metallic, elongate, with posterior tibiae slightly curved. L. 20–30 mm.

Male with the antennæ one and a half times as long as the body, and the thorax rugosely punctured throughout; fifth ventral segment truncate at apex.

Female with the antennæ a little shorter than the body, and the disc of thorax smooth or diffusely punctured; fifth ventral segment rounded and produced at apex.

In decaying willows; rather local, but not uncommon and generally distributed throughout the greater part of England and Wales; London district common; Hertford; Eton; Ely; Dover; Southsea; Devon; Somerset; Tewkesbury; Evesham; Swansea; near Barmouth; Repton (osier beds); common near York; Manchester and Liverpool districts; Keswick; Northumberland district, rare; Scotland, rare, Solway and Forth districts; Ireland, near Belfast; it occurs in many other localities, and is probably very generally distributed from Yorkshire southwards.

ASEMUM, Eschscholtz.

This genus contains ten species, which are found in Europe, Siberia and the Amur district, and North America; the single British species is a broad and robust insect with comparatively short antennæ and the femora not clavate; it has occurred locally in Scotland in stumps of Scotch fir, but has not been found in England or Ireland; the larva is described by Chapuis and Candèze (*Larves des Coléoptères*, p. 244) and by Schiödte (*Pars ix.* 401); it does not present any particular peculiarity, except that the prothorax is smaller than in the other species of the Cerambycina.

A. striatum, L. Oblong, somewhat depressed, black, rather dull, clothed with thick but very fine pubescence, and finely and thickly sculptured; head much narrower than thorax, forehead with a triangular impression, antennæ rather short and robust; thorax transverse, with sides rather strongly rounded, uneven on disc; elytra with about six raised lines on each, of which the alternate ones are less raised; legs black, comparatively short, tarsi pitchy. L. 10–16 mm.

Male with the fifth ventral segment transverse, broadly rounded at apex; in the female the same segment is not transverse and somewhat produced at apex.

In stumps of Scotch fir; local; Scotland, Solway, Forth, Tay, Dee, and Moray districts.

HYLOTRUPES, Serville.

This genus contains two species, one of which is widely distributed and occurs both in Europe and North America, and the other has been described from Australia. *H. Kozicrowiczi*, which has been considered a separate species, appears to be now regarded as a variety of the male of *H. bajulus*; the larva of the latter insect is found in dead pine and fir, and much resembles that of *Callidium variabile*, except that the ocelli are smaller and are three, instead of two, in number; it sometimes does considerable damage to posts and rails.

H. bajulus, L. Oblong, with the elytra much depressed, black, rather shiny, elytra often pitchy black or testaceous; head much narrower than thorax, rugosely punctured, antennæ short, obscurely ferruginous; thorax transverse, villose, with sides strongly rounded, closely punctured, with a smooth central line or space, on each side of which is a large and shining smooth tubercle; elytra rugose, especially on posterior half, with an interrupted band of thick white pubescence before middle often forming four distinct patches; under-side villose; legs moderate, black, more or less pitchy. L. 14–20 mm.

In the male the thorax is less transverse than in the female, and has the central portion more strongly punctured; the fifth abdominal segment, moreover, is truncate or slightly emarginate in the male and produced in the female.

In old posts, rails, &c.; rare; Forest Hill (Marsh); Weybridge (Power); Belvedere (T. Wood); Hammersmith, in orchard trees (S. Stevens); Epping; Hertford; Suffolk; Deal; I have specimens in my collection taken by Lady Maryon Wilson about the year 1795; this lady appears to have been one of the first of our British collectors.

CALLIDIUM, Fabricius.

This is a large and important genus, containing about ninety species, which are widely distributed; they appear, however, to be chiefly confined to the Northern Hemisphere, although species have been described from Brazil and the Australian region; fourteen are found in Europe, of which four occur in Britain; they are very different in size and general appearance.

The larva of *C. variabile* is described by Schiödte (Pars ix. p. 416); it is clothed all over with rather thick and short pubescence; the head is twice as broad as long, with two ocelli on each side, which are rather large, and comparatively long antennæ; the prothorax is about half as broad again as the eighth abdominal segment; the abdomen is furnished with scansorial tubercles; the legs are very short; this larva inhabits dead oak; that of *C. violaceum* sometimes does considerable damage to fir timber; before changing into a pupa it bores into the solid wood to a depth of several inches.

The British species may be distinguished as follows; one of them, *C. sanguineum*, is doubtfully indigenous.

- I. Sides of thorax rounded or almost rounded.
 - i. Upper surface metallic, purple or violaceous *C. VIOLACEUM, L.*
 - ii. Upper surface not metallic.
 - 1. Thorax with more or less distinct prominences on disc; third joint of antennæ scarcely longer than fourth; elytra without white markings; size moderately large *C. VARIABLE, L.*
 - 2. Thorax with disc even; third joint of antennæ plainly longer than fourth; elytra with white markings; size small *C. ALNI, L.*
- II. Sides of thorax strongly angled; upper surface clothed with very thick scarlet pubescence *C. SANGUINEUM, L.*

C. violaceum, L. Rather broad, depressed, purple or violaceous, slightly pilose; head small, depressed in middle; thorax transverse, with sides strongly rounded, closely and rugosely punctured; elytra coarsely and rugosely punctured, but not so closely as thorax, with shoulders strongly marked, obtusely rounded at apex; legs rather long, metallic. L. 8–16 mm.

In the male the antennæ are a little shorter than the body, and in the female much shorter.

In decaying fir posts and stumps; local, but sometimes abundant; Darenth Wood, Roehampton, Forest Hill, Shirley, Leith Hill, Croydon, Dulwich, Walton, Mickleham, Cowfold, Shiere, Reigate, Shipley, &c.; Lowestoft; Hastings; New Forest; Devon; by hundreds for four or five years in wood of an old summer-house at Cirencester (Harker); Binley, near Coventry (F. H. Fowler); Manchester (Stephens).

C. variable, L. (s.g. *Phymatodes*, Muls.). Elongate, rather depressed, shiny, clothed with fine light pubescence; colour very variable, being black with the elytra violaceous, and the mouth, antennæ, anal segment of abdomen, base of femora, and tibiæ and tarsi rufo-ferruginous, or head black, thorax red, elytra violaceous with red border and under-side, except breast, red, or with the apex alone of the elytra violaceous and the legs piceous, or with the whole upper and under sides reddish-testaceous; variations occur between these, the thorax being spotted on disc or more or less infusate, and other differences being more or less marked; head closely punctured, thorax slightly transverse, contracted behind with three more or less distinct tubercles on disc, sparingly punctured; elytra finely punctured; legs rather long, variable in colour. L. 7–15 mm.

Male with the antennæ longer than the body, and the fifth ventral segment subtruncate at apex.

Female with the antennæ shorter than the body, and the fifth ventral segment rounded and produced at apex.

In decaying trees; occasionally taken at sugar on trees; rare; London district, Ripley, Forest Hill, Lee, Chatham, Blackheath, Sheerness, Tonbridge; Sydenham in plenty in June, 1854 (Power); Hammersmith (occasionally taken formerly on old fruit trees in an orchard) (S. Stevens); Epping; Windsor; Hertford; Weston, Oxfordshire (Matthews); Dover; New Forest; Robins Wood, Repton, near Burton-on-Trent; Scotland, recorded by Dr. Sharp from the Forth district, but as not indigenous, and as having been introduced with timber.

C. alni, L. (s.g. *Pœcilium*, Fairm.). One of the smallest of the British Longicorns, short, rather shiny, pubescent; head black, antennæ ferruginous; thorax pilose, closely and distinctly punctured, with sides strongly rounded, depressed at base; elytra depressed, red and distinctly punctured at base, black and very finely punctured behind, with two white lunulate bands on each which nearly meet at suture; legs ferruginous, femora strongly clavate, with the club dark. L. 4–6 mm.

Male with the antennæ three-quarters as long as body, and the posterior femora curved; female with the antennæ scarcely longer than half the body.

In dead hedges and faggot stacks in woods, on flowers, &c.; local; London district, not uncommon; Darenth Wood, Peckham, Blackheath, Forest Hill, Shirley, Horsell, Coombe Wood, Maidstone, Westerham (in hop poles), Tonbridge, Sheerness, Chatham, &c.; Dover; Glanvilles Wootton; Llangollen; Knowle, near Birmingham; Oxfordshire; Repton, Burton-on-Trent; Cumberland; Northumberland district, Gibside.

C. sanguineum, L. (s.g. *Pyrrhidium*, Fairm.). Oblong, depressed, black, clothed with thick and close and rather shining sanguineous pubescence, which gives the insect a bright scarlet appearance; head nearly bare with only a few scattered scarlet hairs, antennæ black; thorax strongly angled at sides, with central line more or less bare; legs black, with femora clavate; under-side black, with sides and apex clothed with reddish hairs; in the male the antennæ are a little shorter than the body, and in the female they are considerably shorter. L. 6–11 mm.

Very rare; in old wood; Stephens records it from London and North Wales, and a fine series from Exeter; two specimens found in an outhouse at Plaistow, by Mr. Hindley (S. Stevens). I have a specimen in my collection given me by Professor Meldola, and sent to him by the proprietors of "Land and Water" (to whom I believe it was sent to be named), but I do not know in what locality it was taken.

CLYTUS, Laicharting.

This genus is one of the largest and most important of the whole Longicornia; it contains nearly four hundred species, which are widely distributed throughout the world both in tropical, temperate, and cold climates; there are about thirty European species, of which three occur in Britain; they are distinguished by having the anterior coxal cavities transverse and very strongly angulated externally; the thorax is scarcely, if at all, longer than broad, and the legs are very long, with the femora clavate but strongly petiolate; the species as a rule are brightly variegated with yellow or whitish bands; *C. arietis* is one of our commonest Longicorns; it is black, brightly banded with yellow, and in flight so much resembles a wasp that it is usually known as "the wasp beetle." The larvæ of *C. mysticus* and *C. arcuatus* are described by Schiödte (Pars ix.

pp. 411-413), but they present no particular points of interest; they are found in wood of oak, lime, beech, &c.

- I. Elytra with yellow bands and markings, without raised callosities at base; femora gradually and not strongly clavate at apex.
- i. Form broader; thorax transverse, with the anterior margin and an oblique band on each side about middle yellow C. ARCUATUS, L.
 - ii. Form narrower; thorax about as long as broad, with the anterior and posterior margins yellow C. ARIETIS, L.
- II. Elytra red and furnished with a raised callosity on each at base; hinder part dark with white markings behind; femora rather abruptly and strongly clavate at apex C. MYSTICUS, L.

C. arcuatus, L. (*Platynotus arcuatus*, Thoms.; s.g. *Plagionotus*, Muls., H. R. W.). A rather large and robust species; dull black, pubescent, very finely punctured; head with a transverse yellow band, antennæ robust and tapering, reddish-testaceous; thorax considerably broader than long, globose, with sides strongly rounded, with the anterior margin and an oblique band on each side behind middle yellow; scutellum yellow; elytra rather broad, gradually narrowed behind, with a line at shoulder, four dots at base, two of which meet at suture, and four fasciæ, the first often broken, the last apical, yellow; the yellow fasciæ consist of thick tomentose pubescence, and are much lighter than in *C. arietis*; legs reddish-testaceous with the femora clavate, and more or less black in middle. L. 10-17 mm.

Male with the posterior femora longer than in the female, and the anterior tarsi strongly dilated.

In decaying trees, old posts, &c.; rare; Greenwich (West); Loughton, Essex (Power); Hertford, Epping, Hainault, Chislehurst, Suffolk, Newcastle, and Cumberland (Stephens); Northumberland district, two specimens (perhaps the same as those recorded by Stephens) (Bold).

C. arietis, L. (*Platynotus arietis*, Thoms.; s.g. *Sphegesthes*, Chevr.). Narrower and less robust than the preceding species, to which it is rather closely allied; it may, however, be at once known by having the thorax about as long as broad, with the sides not very strongly rounded, and the anterior and posterior margins clothed with thick yellow tomentose pubescence; scutellum yellow; elytra with a straight band near base, not reaching suture, a band on each a little behind these meeting or nearly meeting at suture and forming together an inverted V, a straight band on each behind middle meeting at suture, and the apex, yellow; legs reddish-testaceous, with femora sometimes darker, posterior femora, as in the preceding species, longer in the male than in the female. L. 7-14 mm.

In old posts, rails, &c.; common and generally distributed throughout England from the Midland counties southwards; rarer further north; Manchester district; Northumberland and Durham district; recorded by Dr. Sharp as very rare in Scot-

land in the Forth and Clyde districts, and as probably not indigenous, but imported with timber.

C. mysticus, L. (s.g. *Anaglyptus*, Mulsant). Elongate, sub-parallel, clothed with fine ashy pubescence; black, elytra with base red, and hinder part black, with the apex broadly clothed with thick greyish pubescence, and with two or three more or less bent and wavy fasciæ of yellowish-grey pubescence behind the rufous colour of the base; head rather large, closely punctured, antennæ black; thorax somewhat longer than broad, very thickly punctured, with traces of a raised central line in some specimens, sides slightly rounded; elytra considerably more strongly punctured in front than behind, with the shoulders and a callosity on each at base near suture strongly marked; legs black, pubescent, tarsi pitchy, femora clavate; under-side with grey pubescence, and with thick yellowish pubescence at sides of breast. L. 6-11 mm.

Male with the antennæ and posterior femora longer than in the female.

In old posts, dead hedges, &c.; occasionally found in flowers; local; London district, not uncommon, Dartford, Blackheath, Forest Hill, Darenth, West Wickham, Reigate, Tonbridge, Westerham (Kent), Loughton (Essex); The Holt, Farnham; Hainault Forest; Dover; Bath (rare); Bewdley; Trench Woods; Montgomery; Llangollen; Repton, Burton-on-Trent; Cambridge; Askham Bog, York; Dunham Park, Manchester.

One of the records in Stephens' Illustrations, iv. 243, is "Bottisham, C. Darwin, Esq." In the life of Mr. Darwin recently published, we are told by him, as an early reminiscence, that the insertion of his records by Stephens was in his young days a source of great pleasure to him, and this apparently is one of the records that he refers to.

GRACILIA, Serville.

This genus contains four species, one of which is found in Europe, and the other three in North America; our single species is one of the smallest, if not the smallest, of the British Longicorns; it may be distinguished by having the eyes almost divided, the short third joint of the antennæ, and the long and subcylindrical thorax; the anterior coxæ are almost contiguous, and the posterior more widely distant; the femora are stout and strongly clavate; the larva feeds on dry twigs of hazel; it is, consequently, often found in old hampers and baskets in great abundance; it does not call for any particular remark, except that the legs are so small that the larva forms a transition to those of the Lamiidæ; occasionally other allied species of the same habit are imported with foreign baskets; I have received *Leptidea brevipennis*, Muls., from Manchester, where it was found in some numbers; it much resembles *Gracilia*, but may at once be known by its strongly abbreviated elytra.

G. minuta, F. (*pygmæa*, F.). A very small species, narrow, linear, and depressed, clothed with fine silky pubescence, of a lighter or

darker fuscous or fuscous red colour, upper surface very finely punctured, rather dull; eyes black, very strongly emarginate; thorax longer than broad, subcylindrical, slightly dilated at sides, rather uneven; elytra with more or less obsolete depressions towards base; abdomen shining, black or dark brown; legs reddish-brown, with the femora strongly and broadly clavate. L. $3\frac{1}{2}$ –5 mm.

Male with the antennæ plainly longer than the body, and the thorax a third part longer than broad; in the female the antennæ are a very little longer than the body, and the thorax not quite as long as in the male.

In dead twigs, in hedges, &c.; often in old baskets and hampers; locally common; London district, not uncommon and widely distributed; Dover; Portsmouth district; Devon; Hastings; Bristol; Cambridge; Repton, Burton-on-Trent; Sunderland (two specimens, perhaps imported); not recorded from Scotland.

OBRIUM, Latreille.

Eighteen species have been described as belonging to this genus, which will probably prove to be considerably more extensive; they are very widely distributed, having been found in Africa, Japan, Ceylon, North and South America, Tahiti, Sarawak, the Fiji Islands, &c.; three have occurred in Europe; they are rather slender and graceful insects, with very large eyes and very long antennæ; the thorax is considerably longer than broad; the anterior coxal cavities are closed behind, and all the coxæ are nearly contiguous; the first segment of the abdomen is considerably longer than the following; the closed anterior coxal cavities will separate our single species from all the other British members of the tribe except *Molorchus*, from which it may be known by having the abdomen completely covered by the elytra; the species is very rare as a rule, but has been bred by Dr. Power in some numbers from aspen bark; for three years specimens came out of the same bark.

O. cantharinum, L. (*ferrugineum*, F.). A very graceful and pretty species; elongate, finely pilose, with the head and thorax more shining than the elytra, of a pale reddish-testaceous colour, with the eyes black, and the antennæ and legs more or less blackish or brownish, the base of the former, and the club of the femora of the latter being darker than the remainder; head with eyes broader than thorax, antennæ very long, considerably longer than the body; thorax longer than broad, dilated and tuberculate at sides, almost smooth on disc, at all events in the male; elytra rather depressed, irregularly and distinctly punctured; abdomen with the first segment considerably longer than the second. L. 6–11 mm.

Male with the first segment very long, and the second and third emarginate at apex and thickly pubescent.

In aspens, apple trees, &c.; very rare; Wanstead, bred in some numbers (Power); Epping, Leytonstone, Broxbourne, and Brighton (Stephens).

MOLORCHUS, Fabricius.

The members of this genus have the anterior coxal cavities broadly closed, and the elytra strongly abbreviated; the head is about as broad as the thorax, which is longer than broad, and uneven; the abdomen has the first segment a little longer than the second; the legs and antennæ are very long, the latter being either 11-jointed in both sexes, or 12-jointed in the male; the femora are strongly clavate and petiolate; the genus contains fifteen species, of which four are found in Europe, and the remainder have been described from North America, Cuba, Hongkong, &c.; one has occurred in the Australian district; the larva of *M. dimidiatus* (*M. minor*) has been described by Schiödte (Pars ix. 414); it much resembles those of the allied genera, being sparingly pubescent, and broadest in front and narrowed behind; the ocelli appear to be wanting, and the antennæ are a little longer than is usually the case; this larva feeds in dead and decaying boughs of pine and fir.

I. Elytra with an oblique white line on each behind

middle; antennæ in male 12-jointed *M. MINOR*, *L.*

II. Elytra unicolorous; antennæ 11-jointed in both sexes *M. UMBELLATARUM*, *L.*

M. minor*, *L. (*dimidiatus*, *F.*; *Cænoptera minor*, *Thoms.*). Black, rather sparingly pilose, somewhat shining, with the elytra ferruginous-brown or reddish, furnished on each side near apex with an oblique raised white line; antennæ and legs ferruginous, the femora being clavate with the clavate part blackish; thorax longer than broad, thickly and finely punctured, with a row of five smooth tubercles a little before base; elytra very short, sparingly punctured, with shoulders produced and well marked; legs very long. *L.* 6–9 mm.

Male with the antennæ 12-jointed, almost twice as long as body.

Female with the antennæ 11-jointed, a little shorter than body.

On Umbelliferæ, hawthorn blossom, &c.; also in dead hedges and on palings; very rare; Windsor and Hertford (*Stephens*); Wandsworth (*Saunders*); Headley Lane, Esher (*Gore*); Esher (*J. Gray*); Shiere (*Capron*); found on flowers near fir trees at Black Park, and also at Mickleham (*S. Stevens*).

M. umbellatarum*, *L. (*minimus*, *Scop.*; s.g. *Conchopterus*, *Fairm.*). Allied to the preceding, but smaller and narrower, and easily distinguished by having the elytra of a unicolorous testaceous-brown colour, without oblique white lines near apex; the thorax is more coarsely punctured, with a central line nearly smooth and without distinct tubercles at base; the elytra are shorter in proportion, and the legs are more gradually clavate; in the male the antennæ are much longer, and in the female much shorter than the body. *L.* 6–9 mm.

In dead hedges; occasionally found on flowers, especially hawthorn blossom; very local and, as a rule, rare, but sometimes not uncommon where it occurs; Darenth Wood and Whitstable (*Champion* and others); Coombe Wood; Sydenham and Horsell (*Power*); Shiere, near Guildford (*Capron*); it has not occurred, apparently, out of the London district.

(CERAMBYX, L. (*Hammaticherus*, Meg.)

As one or two species belonging to this genus have been found in Britain, it may perhaps be as well to shortly point out its characters; the specimens taken, however, have undoubtedly been imported in the larval state in timber; they are very large and conspicuous insects with the antennæ longer than the body, clothed with silky pubescence, and subserrate, with the third to the fifth joints clavate at apex; the anterior coxal cavities are open behind; the thorax is rugose, and armed with a lateral spine on each side; the elytra are convex and rugose, and the legs are long, with the intermediate tibiæ simple; the larva of *C. heros* is very large, thick, and fleshy, and has been supposed by some authorities to be the Cossus of the ancients, which was much esteemed as a delicacy; it bores into solid oak, to which it often does great damage, and is therefore easily exported in the logs.

The genus is not a very extensive one, but is very widely distributed in both tropical and temperate countries; two, apparently, have been found in Britain.

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| I. Elytra narrowed towards apex, with the sutural angles mucronate | C. HEROS, Scop. |
| II. Elytra not narrowed towards apex, with the sutural angles not mucronate | C. CERDO, L. |

C. heros, Scop. Oblong, gradually narrowed behind, black or pitchy black, upper surface almost glabrous; head with a deep channel; thorax with a spine at sides; elytra rugose, with the apex smoother, and with two obsolete elevated lines on each; the colour of the elytra is sometimes lighter than that of the head and thorax, and the apex is usually lighter; antennæ and legs black. L. 30–40 mm.

Male longer, with the antennæ almost twice as long as the body.

Female smaller, with the antennæ a little shorter than the body.

In oak; recorded from Devonshire, Colney Hatch, and Portsmouth Dockyard; Deal, Aug. 1882 (C. G. Hall).

C. cerdo, L. Very like the preceding, but differs in having the elytra slightly pubescent, not narrowed towards apex, with the apex concolorous, and with no raised lines; the sutural angle is not mucronate; the mandibles, which in the former species are sinuate on their lower margin before the apex, are in this species not sinuate; in the female the antennæ are slightly longer; the general size is smaller. L. 20–33 mm.

On willows, and also on hawthorn blossom; recorded from Deptford and the Isle of Ely; it will be noticed that both species have occurred in dockyards, but have been found also in other localities; if all the species that have been found in dockyards were recorded, they would be found to amount to a considerable number.)

LEPTURINA.

This tribe is represented in Europe by just one hundred species; the number of genera is about twenty, but some authors include *Anoplodera* and *Strangalia*, and even *Grammoptera*, under *Leptura*, and *Pachyta* is differently divided; these are in this work regarded as distinct, but their distinctions are, perhaps, hardly sufficient to warrant their separation; we possess twenty-five species as British, but two or three of these are somewhat doubtfully indigenous.

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| I. Prosternal process reaching hinder edge of anterior coxæ; posterior tarsi with the first joint broad and not compressed; antennæ comparatively short or very short. | RHAGIUM, F. |
| II. Prosternal process very short, not nearly reaching hinder edge of anterior coxæ; posterior tarsi with the first joint narrow and compressed; antennæ long. | |
| i. First joint of posterior tarsi with the usual brush of hair beneath. | |
| 1. Thorax armed at sides with a distinct and large tubercle; fourth joint of antennæ half as long as fifth | TOXOTUS, Serv. |
| 2. Thorax without, or with a very indistinct, tubercle at sides; fourth joint of antennæ nearly as long as fifth | PACHYTA, Serv. |
| ii. First joint of posterior tarsi, and usually the second also, without a brush of hair beneath. | |
| 1. Thorax not produced into a spine at posterior angles. | |
| A. Elytra almost parallel-sided, with antennæ about as long as body | ANOPLODERA, Muls. |
| B. Elytra with the apex plainly narrower than the base, as a rule, gradually narrowed from base to apex,* with the antennæ shorter than body | LEPTURA, L. |
| 2. Thorax produced into a spine at posterior angles. | |
| A. Elytra narrowed from base to apex, usually emarginate at apex, with the exterior angles mucronate | STRANGALIA, Serv. |
| B. Elytra almost parallel-sided, not emarginate at apex | GRAMMOPTERA, Serv. |

RHAGIUM, Fabricius. (*Stenocorus*, Geoffroy.)

I have followed Thomson in retaining the old name for this genus, although Geoffroy's name is adopted by the majority of modern writers; the genus contains about eight species, which are confined to the Northern Hemisphere, with the exception of one that has been described from the Cape of Good Hope; they may be known by their comparatively short or very short antennæ, which in two species do not reach much beyond the base of the thorax, but in the third species are longer, and by the formation of the prosternal process; the eyes are

* In the female of *L. livida* the elytra are subparallel until a little before apex; the antennæ, however, are considerably shorter than the body.

small, and are almost entire or very slightly emarginate; the antennæ are situated high on the forehead, and are almost contiguous at base; the thorax is armed with a strong lateral spine; the anterior coxal cavities are narrowly closed behind; the elytra are rather strongly sculptured, and are furnished with more or less distinct raised lines; down the centre of the abdomen, which is rather strongly pubescent, there runs a very distinct smooth and more or less elevated line.

The larvæ of *Rhagium*, and apparently of the majority of the members of the tribe, are of much more uniform breadth than those of the Cerambycina; the prothorax is very little broader than the posterior abdominal segments, and the whole insect is subparallel until a little before apex; the upper surface is sparingly pubescent, and the antennæ and legs are very short; they live under bark of various trees.

Six species are found in Europe, of which three occur in Britain; their synonymy is somewhat confused, and in the catalogue of Heyden, Reitter, and Weise the name of our well-known species *R. inquisitor* is applied to *R. indagator*; as this would cause considerable confusion, I have adopted the old nomenclature, but have added the synonyms.

- I. Antennæ very short; elytra rather strongly pubescent without distinct oblique yellowish bands.
 - i. Head straight behind eyes; raised lines on elytra ceasing considerably before base *R. INQUISITOR*, F.
 - ii. Head narrowed behind eyes; raised lines on elytra continued almost to base *R. INDAGATOR*, Gyll.
- II. Antennæ longer; elytra feebly pubescent with two strongly marked oblique yellowish bands on each *R. BIFASCIATUM*, F.

R. inquisitor, F., Gyll. (*mordax*, De G., Thoms.). Oblong, black, clothed with ashy pubescence, elytra with two wavy testaceous bands on each about middle, enclosing glabrous black spots on exterior margin often meeting suture; the general pubescence is more or less interrupted, and gives the insect a closely mottled appearance; head nearly square with a smooth black space behind eyes, antennæ very short; thorax longer than broad, with lateral spines comparatively blunt, constricted in front and depressed behind; elytra coarsely punctured, with raised lines, which cease considerably before base; legs black, pubescent. L. 14–18 mm.

In decaying ash, elm, oak, fir and other trees; common and generally distributed throughout the greater part of the kingdom; local in Scotland. Ireland, common in old woods in Tyrone, Kerry, Sligo, Mayo, &c.

In the Entomologist's Monthly Magazine, vol. xviii. p. 18, I inserted the following note on this insect, which perhaps is worth reproducing:—
“Having noticed the strength of jaw of several beetles and other insects, I tried some experiments with a specimen of *R. inquisitor*. The beetle was held between the finger and thumb, and the weights used were wrapped in a sheet of paper tied round with a string of sufficient size to give the beetle a firm grip, and yet allow it to let go easily when it felt inclined. The greatest weight raised was 5 ounces, or 2187.5 grains; the beetle weighed exactly 4 grains in a chemical balance, so

that it supported in its jaws 547 times its own weight ; this is in the same proportion as if a man of 11 stone were to support $37\frac{1}{2}$ tons, a fact that shows clearly the enormous strength not only of the jaws, but also of the neck and other muscles of the beetle."

R. indagator, Gyll. (*inquisitor*, L., Thoms., H. R. W., *nec* F. and Brit. Cat.; *investigator*, Muls.). Smaller on the average than the preceding, and easily distinguished, apart from other differences, by having the raised lines on the elytra continued almost to base, and the head narrowed behind eyes; the upper surface is clothed with somewhat mottled greyish pubescence, the disc of the elytra being furnished with more or less distinct and reticulate smooth black markings, and with two more or less distinct black fasciæ, one before and the other behind middle; the thorax has the anterior margin dull ferruginous, and a somewhat smooth central line; the legs are black, with the femora and tibiæ strongly pubescent. L. 12–16 mm.

In the male the fifth ventral segment is truncate at apex, in the female it is rounded and produced.

In birch, fir, &c.; very rare in England; Shropshire (Stephens); Hainault Forest (Power); Repton (Garneys); I believe, however, that the two latter localities are probably in error, through wrong numbering or some other cause; Scotland, locally common, Solway (?), Tay, Dee, and Moray districts.

R. bifasciatum, F. (*bicolor*, Ol.; *unifasciatum*, Muls.). More shining than the two preceding species, and with longer antennæ; colour black with the elytra more or less reddish at sides and shoulders, and with two very distinct oblique testaceous fasciæ on each, which in certain not uncommon varieties are much enlarged and confluent, the testaceous colour covering a great part of the elytra; very rarely they are absent; pubescence fine and scanty; head scarcely narrowed behind eyes; antennæ ferruginous; thorax with very strong lateral spines, and with a smooth central longitudinal line; elytra with well-marked shoulders, somewhat narrowed to apex, coarsely and rugosely punctured, with raised lines which are more distinct behind, but are more or less plainly continued to base; legs black, with tarsi, femora, and tibiæ all more or less rufous. L. 14–20 mm.

In decaying fir stumps, &c.; somewhat local, but generally distributed throughout the greater part of England and Wales; Scotland, common in fir wood, Solway, Tweed, Forth, Clyde, Tay, Dee, and Moray districts; Ireland, Powerscourt (Dublin), Newcastle, co. Down, and probably widely distributed.

TOXOTUS, Serville.

This genus contains about thirty species, which are chiefly found in Europe, Northern Asia, and North America; one has been described from Madagascar, but this is the only one that has occurred within tropical limits; of the five European species one only is found in

Britain; it is a large and conspicuous insect, and may be known by the large tubercle at the sides of thorax and the short fourth joint of the antennæ; the antennæ are almost approximate, and inserted at some little distance from the eyes, which are very slightly emarginate; the elytra are gradually and strongly narrowed from base to apex; the anterior coxal cavities are open behind; the legs and antennæ are long and slender; like most of the other members of the tribe, it is found in June and July on Umbelliferae; the larva is found in stumps of deciduous trees.

T. meridianus, Panz. (*chrysogaster*, Schrank.). A conspicuous species, very variable in size, with the head and thorax much narrower than the elytra, and the elytra considerably narrowed behind; colour variable, the head and thorax being always black, and the elytra entirely black or entirely rufo-testaceous, or with the apex broadly and the suture black and the rest testaceous, or with the base only testaceous; under-side black clothed with silvery pubescence, or testaceous clothed with golden pubescence; antennæ and legs black in black specimens, and more or less red in those that have the elytra rufo-testaceous; thorax oblong, with a central channel, furnished at sides with a strong tubercle but not spined, disc uneven; scutellum black; elytra with well-marked shoulders, very finely sculptured, with obsolete raised lines; legs long, with strong tibial spurs. L. 15–24 mm.

Male smaller, with the elytra more attenuated to apex, and the antennæ longer than in female, and with the fifth segment of the abdomen subtruncate at apex; in the female this segment is sinuate on both sides, and longitudinally impressed in the middle.

On flowers, especially Umbelliferae, in woods; often flying in the hot sunshine; somewhat local, but generally distributed and common from the Midlands southwards; rarer further north; Northumberland and Durham district, not common; not recorded from Scotland.

PACHYTA, Serville.

The British members of this genus are known from the preceding by having no distinct tubercle at the sides of the thorax, and by the fact that the third and fourth joints of the tarsi are nearly equal; they are also smaller and more robust-looking insects; as ordinarily constituted the genus contains about seventy species, which are all found in Europe, North America, and North and Central Asia; the constitution of the genus has, however, been much altered by modern authors. In the last European catalogue the genus *Pachyta* contains only two species, neither of which are found in Britain, and of our three species two are referred to *Leptura* and one to *Acmæops*.

- I. Eyes slightly emarginate; thorax black; elytra yellow with black markings, or black with yellow markings.

- i. Form broader and less parallel ; pubescence and punctuation coarser ; elytra yellow with black markings *P. CERAMBYCIFORMIS*, Schrank.
(*octomaculata*, Schall.)
- ii. Form narrower and more parallel ; pubescence and punctuation finer ; elytra black, with three pale yellow, transverse, angular bands *P. SEXMACULATA*, L.
- II. Eyes entire ; thorax red ; elytra bluish-black (s.g. *Acmæops*, Lec.) *P. COLLARIS*, L.

P. cerambyciformis, Schrank. (*octomaculata*, Schall.; s.g. *Iudolia*, Muls.). Black, clothed with greyish pubescence, which is thickest and longest on the thorax, elytra testaceous, with four variable spots on each, two behind base situated in the same more or less oblique line and often confluent, one just behind middle, and the fourth at apex ; head considerably produced before antennæ, closely punctured ; thorax broadest behind and narrowed in front, with posterior angles somewhat projecting, closely punctured ; elytra broad in female, narrower in male, rather closely but distinctly punctured ; legs and antennæ black ; in the male the general form is smaller and narrower than in the female, and the antennæ are longer in proportion. L. 8–12 mm.

On flowers of Umbelliferae, &c. ; very local ; Colney Hatch ; Haslemere ; New Forest ; Devon, Ashburton and Barnstaple ; Swansea ; Dean Forest ; Malvern ; Bewdley Forest (in abundance) ; Cumberland ; Northumberland and Durham district ; Scotland, extremely rare, Tweed district, "once taken in Peasedean, Berwickshire, Mr. Hardy," Murray's Catalogue.

P. sexmaculata, L. (*trifasciata*, F. ; s.g. *Iudolia*, Muls.). Closely allied to the preceding, but may be distinguished by its narrower and more parallel form, more shining appearance, the much scantier and finer pubescence, finer punctuation, blacker colour, and shorter basal joint of the posterior tarsi. The elytra also are differently marked, being black, with three pale yellow, transverse, angular bands, one at base, one a little before the middle, and one at about two-thirds of their length. L. 8–11 mm.

Two specimens taken by Mrs. King on fir palings immediately adjoining the Rothiemurchus Forest, Aviemore, Inverness-shire, on June 30th and July 2nd, 1877 ; the species is rather common in Sweden, North Germany, &c.

P. collaris, L. (*Acmæops collaris*, Lec.). Smaller than either of the preceding, and easily distinguished by having the eyes entire, and by its colour, which is entirely black or bluish-black with the thorax bright red ; the abdomen also is red ; upper surface clothed with long fuscous pubescence ; thorax much narrower than elytra, narrowed in front and broadest behind, diffusely and finely punctured ; elytra subparallel, with shoulders well marked, depressed on disc, rather closely, but strongly and somewhat rugosely punctured ; legs rather long, black. L. 7–9 mm.

In the male the antennæ are longer than in the female, and the general size is smaller.

On flowers of *Umbelliferæ*, especially in and near hop-gardens; local, but usually common where it occurs; Darenth Wood, Shooter's Hill, Tonbridge, Maidstone, Bexley, Chatham, &c.; New Forest; Devon; Upton-on-Severn, Malvern; Bewdley; banks of the Bollin, Cheshire; Manchester district; not recorded from further north.

ANOPLODERA, Mulsant.

This genus is very closely allied to *Leptura*, from which, indeed, it can hardly be separated; the chief difference appears to lie in the fact that the antennæ are longer and that the elytra are more parallel; the cheeks are broad, and the neck narrow and constricted; the thorax is pubescent, with the posterior angles not prominent; eleven species have been described from North and Central Asia and from Europe; of the four European species one is found in Britain; it is rarely unicolorous black, but as a rule may be easily known from all our species of *Leptura* by the large yellow spots on the elytra, which are sometimes more or less confluent.

A. sexguttata, F. (*Leptura sexguttata*, auct.). Elongate and sub-parallel, rather depressed, black, under-side and scutellum clothed with thick silvery pubescence, upper-side with fine and rather scanty ashy pubescence, elytra with three large yellow spots on each placed longitudinally, the hinder pair of which are sometimes confluent; occasionally these are entirely wanting; head and thorax strongly and closely punctured, the latter pilose, rather convex, narrowed in front, with posterior angles obtuse, and with an obsolete central channel; elytra strongly punctured, with the punctuation much less close than that of thorax; legs moderately long. L. 8-11 mm.

The two posterior spots appear to be usually confluent in the male, in which sex the intermediate coxæ are armed with a small tooth, and the posterior tibiæ have the interior margin subcarinate behind and terminated by a single spur, instead of by two as in the female.

On flowers in woods, and by sweeping grass; rare; Darenth Wood, Kent; New Forest; there appears to be no other British locality known; the entirely black variety has been taken by Dr. Power at Darenth, and recently by Mr. Gorham in the New Forest.

LEPTURA, Linné.

This genus, in its widest sense, includes between two and three hundred species; these are chiefly confined to the Northern Hemisphere; a few, however, have been described from South America, South Africa, &c.; if we take out the genera *Anoplodera* and *Strangalia*, about thirty species are found in Europe; the genus *Leptura* proper is easily distinguished from *Strangalia* and *Grammoptera* by not having

the posterior angles of the thorax produced into a spine; the larvæ are a little narrower behind than in front, but do not call for any particular remark; of the six British species one or two are doubtfully indigenous. *L. rufa* has been comparatively recently introduced, and rests on one specimen, so that it requires further confirmation before it can be admitted into our lists.

- I. Antennæ less distant at base; thorax channelled; upper surface clothed with very thick greenish pubescence *L. VIRENS, L.*
- II. Antennæ rather widely distant at base; thorax not or obsoletely channelled; upper surface more or less scantily clothed with greyish pubescence.
 - i. Anterior coxal cavities open behind.
 - 1. Colour entirely black; length 14–18 mm. *L. SCUTELLATA, F.*
 - 2. Elytra of male yellowish or yellow-brown with the apex broadly, and the exterior margin narrowly, black; of the female bright red; length 9–12 mm. *L. SANGUINOLENTA, L.*
 - 3. Elytra testaceous or yellow-brown, unicolorous in both sexes; length 6–7 mm. *L. LIVIDA, F.*
 - ii. Anterior coxal cavities closed behind; elytra yellow with apex black; length 10–12 mm. *L. FULVA, De G.*

L. virens, L. Black, thickly clothed on both upper and under side with dense greenish pubescence, which is brighter on the under surface; head rather large, antennæ ringed with yellow; thorax convex, strongly constricted just before anterior margin, with posterior angles obtuse, very closely and rather strongly and rugosely punctured; elytra broad at base and much narrowed to apex, finely, very closely, and rugosely punctured; legs thickly clothed with greenish pubescence; in the male the fifth ventral segment of the abdomen is very slightly excised in the middle at apex. L. 15–18 mm.

On flowers; very rare and doubtfully indigenous; recorded by Stephens from the Forest of Dean and from Scotland; one or two other specimens without locality are in our collections. Dr. Sharp does not include the species in his Scotch list, and it might perhaps with advantage be omitted or placed with the doubtful species.

L. scutellata, F. A large and robust species, rather broad, especially in the female, entirely of a deep black colour, with the under-side rather thickly clothed with silky greyish pubescence, and the upper-side scantily pubescent; head very closely punctured; thorax a little longer than broad, convex, very strongly and more or less rugosely punctured, base strongly sinuate; posterior angles of thorax and scutellum thickly clothed with greyish pubescence; elytra deeply and coarsely punctured towards base, rather finely towards apex. L. 14–18 mm.

Male with the posterior tarsi longer than in female, and the fifth ventral segment deeply emarginate at apex.

In old stumps of beech, &c.; rare; New Forest (in some numbers); it has also been recorded from Cobham Park, Epping Forest, and Hainault Forest.

L. sanguinolenta, L. Elongate, slightly convex, black, with the elytra differing in the sexes, clothed with greyish pubescence; antennæ black; thorax very closely punctured, a little longer than broad, with the anterior margin slightly elevated, and the sides furnished with white villose hairs; elytra more sparingly punctured than thorax, and more finely at apex than at base; legs rather long and slender, black. L. 10-12 mm.

Male with the elytra livid testaceous, with the apex broadly, and the exterior margin narrowly, black; fifth ventral segment of abdomen subtruncate at apex.

Female with the elytra sanguineous, with the apical point black, and the fifth ventral segment of abdomen slightly impressed before apex.

On flowers; very rare; recorded by Stephens from Norfolk, Suffolk, and Bickham, Devonshire, and also from near London; Mr. Champion has found one specimen at Aviemore, Moray district, Scotland, but this is the only capture that has been recorded for many years.

L. fulva, De G. (*tomentosa*, F.). Black, thickly clothed beneath with silvery pubescence, elytra testaceous with the apex black; head very closely punctured, antennæ black; thorax convex, closely and deeply punctured, strongly constricted just before apex, pilose; elytra broader in female than in male, distinctly but not strongly punctured, and clothed with scanty yellowish pubescence, which is longer towards base; legs rather stout, black. L. 10-12 mm.

Male with the fifth ventral segment of abdomen broadly impressed, and bidentate at apex; posterior tibiæ slightly thickened in the middle.

On flowers; rare; New Forest (Blatch); Southampton (Newbery); Southsea (Moncreaff); Haslar; Ryde; Kingsbridge, Devon; Swansea.

L. livida, F. (s.g. *Vadonia*, Muls.; *Pachyta livida*, Steph.). Much smaller than either of the preceding species, black with the elytra livid testaceous, under-side with silvery pubescence, upper surface rather sparingly clothed with greyish pubescence, thorax pilose; head strongly punctured, antennæ stout and comparatively short, black; thorax longer than broad, coarsely punctured; elytra broader in female than in male, rounded at apex, unicolorous, with the punctuation composed of large shallow punctures; pygidium exposed; legs black, anterior tibiæ and tarsi ferruginous. L. 6-7 mm.

On flowers; local; London district, rather common and generally distributed, Weybridge, Woking, Darenth, Forest Hill, Lee, Chatham, Tonbridge, Horsell, Whitstable, Gravesend, Sheerness; Essex; Deal; Sandwich; Hastings; Portsmouth district; New Forest; Weymouth; Devon; Swansea; Suffolk; Hertford; Clacton; Burnt Wood, Staffordshire; it does not occur apparently further north than the Midland counties, in which it is very rare.

(*L. rufa*, Brullé. Allied to *L. scutellata* and of about the same size, with the head, thorax, and antennæ black (the first joint of the latter sometimes red), and the elytra brownish-red, punctured coarsely at the

base and finely at the apex. The under-side is covered with ashy pubescence, the abdomen being more or less red towards the tip. L. 15-17 mm.

A single male was taken by Mr. Thorncroft at Holme Bush, Sussex, in the summer of 1865; the species is found rarely in the south of France, Spain, Turkey, and Greece, so that in all probability this specimen can hardly be considered indigenous, as no other specimen has occurred either before or since, and it might have been imported in timber.)

STRANGALIA, Serville.

According to the Munich catalogue and M. Lameere's supplement the genus *Strangalia* proper only contains fourteen species, of which one only (*S. attenuata*) is found in Europe, the rest being described from North America, Northern Asia, and Persia; a large number of species, however, which have been included under *Strangalia* are placed under *Leptura* by Gemminger and Von Harold, Thomson, Reitter, and others; of these eighteen inhabit Europe, of which six occur in Britain; they are found like other members of the tribe on Umbelliferae and other flowers; the larvæ occur in decaying wood of various trees; that of *S. armata* is described by Westwood (Classification, i. p. 369); it is subparallel, with the head nearly as broad as the prothorax, which, together with the head, is depressed and scaly; the posterior margin of the thorax is furnished with a transverse series of short recurved spines, and the same is the case with the abdominal segments of the pupa; the extremity also of the abdomen is terminated by two acute points bent upwards.

The species much resemble those belonging to the genus *Leptura* proper, but may easily be distinguished by having the posterior angles of the thorax produced in a spine; from *Grammoptera* they may be known by having the elytra distinctly narrowed to apex.

- I. Thorax narrowly or very narrowly and suddenly constricted just before apex; elytra with the humeral tubercle situated on the base.
 - i. Elytra black with yellow or reddish-yellow bands.
 1. Thorax with anterior and posterior margins thickly clothed with yellowish hairs *S. AURULENTA*, F.
 2. Thorax without distinct rows of yellowish hairs on margins *S. QUADRIFASCIATA*, L.
 - ii. Elytra unicolorous, black or reddish *S. REVESTITA*, L.
- II. Thorax gradually narrowed and feebly or not at all constricted from anterior third; elytra with the humeral tubercle situated behind base.
 - i. Anterior coxal cavities closed behind; thorax with a lateral tubercle before middle; elytra light yellow with black markings *S. ARMATA*, *Herbst*.
 - ii. Anterior coxal cavities open behind; thorax without lateral tubercles.
 1. Posterior tarsi with the third joint pubescent

- beneath at apex only; elytra black with reddish-yellow bands; length 10-12 mm. S. ATTENUATA, L.
2. Posterior tarsi with the third joint entirely pubescent beneath; length 7-9 mm.
- A. Colour entirely black S. NIGRA, L.
- B. Elytra reddish or reddish-yellow with apex and suture black S. MELANURA, L.

S. aurulenta, F. (s.g. *Stenura*, Dej.). A large and conspicuous species of a deep velvety black colour, with four transverse reddish-yellow bands on elytra, one at base, one a little before middle, a third behind middle, and a fourth before apex, usually taking the form of a patch, apex black; sometimes the yellowish colour prevails over the black, so that many authors describe them as reddish-yellow with four black fasciæ; head closely punctured, depressed between eyes; thorax about as long as broad, not very closely punctured, with the anterior and posterior margins thickly fringed with yellowish hairs; scutellum also thickly clothed with yellowish hairs; elytra finely and asperately punctured, clothed with fine yellowish pubescence, strongly emarginate and mucronate at apex; legs elongate. L. 14-22 mm.

Male narrower and smaller than female, and with the elytra considerably narrowed behind, and the antennæ longer; the antennæ and legs in this sex are black or mostly black, whereas in the female they are more or less red-yellow.

On flowers; very rare; a considerable number of specimens have been taken by Charles Turner and others in the New Forest; Arundel (once, S. Stevens); between Barnstaple and Bideford, Devon (Stephens); Plymouth (J. H. Keys); Briton Ferry, near Swansea (Dillwyn). Ireland, "male and female taken at Glengariffe in Lord Bantry's demesne by Mr. W. F. de V. Kane (Rev. W. F. Johnson)."

S. quadrifasciata, L. (s.g. *Stenura*, Dej.). Allied to the preceding, but with a less golden and velvety appearance, and easily distinguished by the absence of a thick row of yellowish hairs on anterior and posterior margins of thorax, which is rather sparingly clothed with greyish pubescence; antennæ black, with the apex reddish in the female; elytra finely and asperately punctured, black with four yellow fasciæ, which are sometimes interrupted, and sometimes cover a great part of the elytra, apex black, emarginate, and mucronate; legs black, elongate; in the male the fifth ventral segment is slightly emarginate at apex. L. 10-17 mm.

On flowers; as a rule rare, but sometimes not uncommon locally; Dulwich, Darenth Wood, Sittingbourne, Westerham, Chatham, Hainault Forest; Hastings district, rather common; Parkhurst, Isle of Wight; Swansea; Bewdley Forest; Cannock Chase; St. Osyth; Sherwood Forest; Northumberland and Durham district, widely distributed, but not common; Scotland, rare, Solway, Clyde, Tay, and Moray districts. Ireland, "Glengariffe in Lord Bantry's demesne, twelve specimens taken in half an hour on ragweed by Mr. W. F. de V. Kane (Rev. W. F. Johnson)."

S. revestita, L. (*villica*, F.; s.g. *Stenura*, Dej.). Ferruginous red,

slightly pubescent, with the scutellum, breast, and elytra black, the latter rather finely punctured and clothed with fuscous pubescence; thorax transverse, with the disc convex and impressed on each side with a broad fovea; sometimes the elytra are entirely rufous, and occasionally their humeral margin alone is of this colour; the female appears to have the base of the antennæ and the apex of the tibiæ and tarsi reddish. L. 9–12 mm.

On flowers; very rare; Colney Hatch Wood, Coombe Wood, Windsor, and Gamlinghay, Cambridge (Stephens); Darenth Wood and Birch Wood (S. Stevens); there is one specimen without locality in Dr. Power's collection.

S. armata, Herbst. (*elongata*, De G.; *maculata*, Poda.; ♂ *calcarata*, F., ♀ *subspinosa*, F.; s.g. *Stenura*, Dej.). Elongate, clothed with yellow pubescence, black, with the antennæ and legs variegated with yellow, and the elytra light yellow with very variable black markings and fasciæ, which sometimes spread over almost the whole surface, and at others leave the greater part of the elytra yellow; the basal fascia is as a rule composed of two spots on each elytron, and the second is interrupted more or less broadly at suture; head rather long; thorax longer than broad with a tubercle on each side, rather closely, but distinctly punctured; elytra more or less narrowed to apex, shallowly and not closely punctured, emarginate and mucronate at apex. L. 11–17 mm.

Male smaller and more strongly narrowed behind, with the metasternum furnished in middle with two crests of hairs, and the posterior tibiæ thickened, strongly sinuate behind middle, with the sinuation crenulate and terminated by a tooth at each extremity.

Female with the basal segments of the abdomen marked with yellow, and the posterior tibiæ slightly curved at apex.

On flowers, &c.; common and generally distributed from the Midland counties southwards, but rarer further north; Cheshire; Manchester; Northumberland and Durham district; Scotland, extremely rare, Solway district, the only record being "Little Ross, Kirkeudbrightshire, Mr. J. T. Syme," Murray's Cat. Ireland, Powerscourt near Dublin.

S. attenuata, L. Elongate, slender, clothed with yellow pubescence, black, with the elytra furnished with four reddish-yellow bands; antennæ partially ferruginous; thorax elongate with the sides a little dilated in the middle; elytra strongly narrowed behind; legs yellow, with the apex of the posterior tibiæ and femora, and the tarsi, black, the latter with the third joint elongate, and only pubescent beneath at apex. L. 10–12 mm.

Male with the abdomen yellow in the middle, and the fifth segment longitudinally impressed, rather strongly emarginate at apex, and produced on each side in a tooth.

Female with the abdomen black, and the fifth segment impressed and not strongly emarginate at apex; in this sex the second and third segments of the abdomen are occasionally yellow at base.

On flowers; very rare, and somewhat doubtfully indigenous; Salisbury and Southend (Stephens); there are one or two other specimens in collections without locality.

S. nigra, L. (s.g. *Stenura*, Dej.). Elongate, slender, entirely deep black, moderately shiny, with the abdomen rufous, the base and rarely the apex being more or less black; upper surface clothed rather sparingly with fuscous pubescence, under-side clothed thickly with greyish pubescence; head large, rather strongly punctured, with a fine central line, antennæ nearly as long as body; thorax longer than broad, much narrowed in front, finely and sparingly punctured; elytra more strongly punctured than thorax, the punctuation being somewhat asperate, apex slightly emarginate; in the male the metasternum is bicristate in the middle. L. 8–10 mm.

On flowers in woods; local, and not common, although sometimes taken in some numbers where it occurs; Darent Wood, Dulwich, Ripley, Coombe Wood, Tonbridge, Westerham; Shipley, near Horsham; Norfolk; Suffolk; New Forest; Devon; Swansea; Bewdley Forest; it has not apparently been found further north than the Midland districts.

S. melanura, L. (s.g. *Stenura*, Dej.). Broader than the preceding species, black, clothed with scanty pubescence above, and thick greyish pubescence beneath, elytra coloured differently in the sexes; head and thorax thickly and strongly punctured, the latter longer than broad, much narrowed in front; elytra less closely and not so strongly punctured as thorax, more finely behind, apex slightly emarginate; legs long. L. 6–10 mm.

Male with the elytra livid testaceous, the apex being broadly, and the suture narrowly, black; fifth ventral segment subtruncate at apex.

Female with the elytra bright red, the apex and suture being very broadly black.

On flowers; generally distributed and common from the Midland counties southwards; rarer further north; Burnt Wood, Staffordshire; Northumberland and Durham district; not recorded from Scotland.

GRAMMOPTERA, Serville.

This genus is sometimes included under *Leptura*, and one of the species, *G. tabacicolor*, is placed in a separate sub-genus *Alosterna* by Mulsant; the species are distinguished by their parallel, and in most cases subcylindrical form, and by having the posterior angles of the thorax produced in a spine at apex; they are comparatively small insects; about thirty species are comprised in the genus, which are all described from Europe and the Caucasus district, Northern Asia, and North America, with the exception of one from Asia Minor, and one from Algeria; all the European species occur in Britain; they may be distinguished as follows:—

I. Elytra testaceous with suture narrowly black . . . *G. TABACICOLOR*, De G.

II. Elytra black or pitchy black.

- i. Legs more or less black; pubescence grey.
 - 1. Antennæ entirely black G. ANALIS, Panz.
 - 2. Antennæ with the first two joints clear reddish,
and the rest reddish with the apex black G. RUFICORNIS, F.
- ii. Legs light reddish-testaceous, with the tibiæ more
or less pitchy; pubescence yellow, scanty at apex,
which appears dark G. PRÆUSTA, F.

G. tabacicolor, De G. (*lævis*, F.; s.g. *Alosterna*, Muls.; *Leptura chrysomeloides*, Schrank., H. S. W.). Elongate, narrow, linear, black with the elytra livid testaceous, the apex and suture being narrowly black; under-side with thick silvery pubescence; head large, antennæ black with base reddish; thorax longer than broad, very closely punctured, with rather thick and fine greyish-yellow pubescence; elytra somewhat strongly and not closely punctured, with rather coarse yellowish pubescence; legs yellow, with the tarsi and sometimes apex of posterior femora black. L. 6–8 mm.

Male with the elytra very slightly narrowed to apex, and with the antennæ a little longer than in female, in which latter sex the elytra are quite parallel.

On flowers, &c.; in woods and hedges; not uncommon, and generally distributed in the London district and the South, and found in many Midland localities; rarer further north; Lincoln; York; Northumberland and Durham district; Scotland, very rare, Tweed and Forth districts; "Peasedean, Berwickshire, and Midcalder," Murray's Cat. Ireland, near Dublin and Belfast.

G. analis, Panz. (*abdominalis*, Steph.; *variegata*, Germ.; *femorata*, Muls.). Elongate, linear, parallel-sided, black, clothed with somewhat scanty ashy pubescence above, and thick silvery pubescence beneath; head large, antennæ entirely black; thorax rather longer than broad, very closely and finely punctured; elytra a little broader in proportion than in the following species, with close and rather strong and somewhat asperate punctuation, pubescence almost wanting at apex, which thus appears darker; apical segments of abdomen more or less rufous; legs black, femora with base red. L. 7–9 mm.

On flowers and oak trees, &c.; rare; Darenth Wood (Stephens); Westerham, Kent (Gorham); Belvedere (Wood); New Forest (Stevens, Champion, Power, and others); I have taken it at Matlock in the Lovers' Walks at the beginning of June.

G. ruficornis, F. Smaller than the preceding, which it much resembles in general appearance, black, clothed with ashy pubescence, which is scanty above, and thick and silvery beneath; antennæ with the two basal joints red, and the remainder red at base and black at apex; thorax longer than broad, very closely punctured; elytra closely and rather coarsely punctured; legs red with the tarsi and the posterior tibiæ black, and the femora all more or less dark at apex; in some

specimens (var. *pallipes*, Steph.) the antennæ and legs are entirely rufo-testaceous.

Male with the posterior tibiæ very slightly curved, and the elytra a very little narrowed towards apex.

On flowers, &c.; in woods and hedges; generally distributed and common from the Manchester district southwards; Northumberland and Durham district; it is, however, recorded by Dr. Sharp as very rare in Scotland in the Tweed and Forth districts, "Colinton near Edinburgh and Peasedean," Murray's Cat. Ireland, near Dublin.

G. præusta, F. (*ustulata*, Schall.). About the size and shape of *G. analis*, black, with the upper-side rather thickly clothed with short shining golden pubescence, which is almost absent on head and apex of elytra, which therefore appear black; under-side very thickly pubescent; antennæ fuscous with the base red, or ferruginous; thorax not much longer than broad, very closely punctured; elytra rather broad in proportion, subcylindrical, very closely punctured, and more finely than in the other species; legs testaceous, with the tarsi fuscous. L. 7-8 mm.

On flowers, especially hawthorn; rare; has chiefly occurred in the New Forest, where it has been taken by several collectors. Mr. S. Stevens has taken it on oak trees in company with *G. analis*. Mr. Moncreaff has taken it at Southwick, near Southsea.

LAMIIDÆ.

The chief distinctive character of this family is found in the fact that the anterior tibiæ are obliquely grooved on their inner side; as a rule the palpi have the last joint cylindrical and pointed; the number of genera and species is very large; in fact the whole of Vol. X. of the Munich catalogue (with the exception of a few pages devoted to the Bruchidæ) is taken up with their enumeration, and a large number are added in M. Lameere's supplement; about thirty-five genera and two hundred and thirty species are found in Europe, of which twelve genera and only seventeen species have hitherto occurred in Britain.

I. Femora distinctly clavate; thorax with lateral spines or tubercles.

i. Antennæ much longer than the body; upper surface smoother.

1. Antennæ in male four times as long as the body; anterior coxæ rather widely distant; size large . . .

ACANTHOCINUS, Steph

2. Antennæ in the male about twice as long as the body; anterior coxæ slightly distant; size small . . .

LEIOPUS, Serv.

ii. Antennæ not or scarcely longer than the body; upper surface more uneven; size small

POGONCHÆRUS, Latr.

II. Femora not or scarcely clavate.

i. Thorax armed with a lateral spine on each side.

1. Anterior coxal cavities closed behind; antennæ shorter

LAMIA, F.

2. Anterior coxal cavities open behind; antennæ longer

MONOCHAMMUS, Latr.

ii. Thorax without lateral spines.

1. Tarsal claws simple; anterior coxæ distant; antennæ ringed with white.

- A. Mesosternum protuberant between intermediate coxæ; form short and broad MESOSA, *Serv.*
- B. Mesosternum not protuberant between intermediate coxæ; form elongate.
 - a. Antennæ 12-jointed AGAPANTHIA, *Serv.*
 - b. Antennæ 11-jointed SAPERDA, *F.*
- 2. Tarsal claws appendiculate, or split or toothed; anterior coxæ almost contiguous; antennæ not ringed with white.
 - A. Eyes entirely divided into two parts TETROPS, *Steph.*
 - B. Eyes not entirely divided.
 - a. Third joint of antennæ very much longer than fourth; first joint of tarsi longer than second and third together; elytra without raised lines STENOSTOLA, *Redt.*
 - b. Third joint of antennæ not much longer than fourth; first joint of tarsi about as long as, or shorter than, second and third together.
 - a*. Elytra scarcely emarginate at apex, rather finely punctured, with two raised lines at sides; size smaller; legs moderately long PHYTÆCIA, *Muls.*
 - b*. Elytra plainly emarginate at apex, very coarsely punctured, without raised lines; size larger; legs short and robust OBEREA, *Muls.*

ACANTHOCINUS, Stephens. (*Astynomus*, Stephens.)

The members of this genus may be known by their exceedingly long antennæ, which, in the male, are several times longer than the body; the thorax has a lateral spine on each side behind middle; the anterior coxæ are rather widely distant, and the intermediate pair still more so; the posterior tarsi have the third joint clothed with pubescence beneath; in the female the sixth segment of the abdomen is much produced, and the ovipositor is exerted. The genus contains thirty-two species, which are widely distributed from Siberia to Tasmania; several species have been described from Mexico and the Amazon district; of the five European species one occurs in Britain.

The larva of *A. ædilis* is described by Schiödte (Pars ix. p. 424); it does not differ much from those of the other Lamiidæ which are especially characterized by the absence of legs; the form is slightly narrowed behind; there are two ocelli on each side, which are rather large and convex; the anal segment is trifurcate; the whole upper surface is rather thickly pilose; the larva lives in wood of pine; its pupa is figured by Westwood (Classification i., p. 363, fig. 44, 4); it is very strongly narrowed behind, and has the long antennæ curled round in a loop so that the apex just rests upon the eyes.

A. ædilis, L. (*montanus*, *Serv.*). A large and conspicuous species of rather short and broad form, fuscous brown or chocolate brown, thickly clothed with greyish pubescence; head narrower than thorax, antennæ very long, widely distant at their insertion, ringed with white; thorax strongly transverse, coarsely and not closely punctured, with four yellow pilose tubercles placed transversely on front of disc, and with the lateral spines short and blunt; elytra more coarsely punctured in front

than behind, with a dark fascia behind middle; legs pubescent, apex of tibiæ and tarsi bare, ovipositor of female exserted, black. L. 12–18 mm.

Male with the antennæ four times as long as the body; in the female they are only twice as long as the body.

On pine and fir logs; local; rare in England, and probably imported; London district; Suffolk; Devonshire; Bath (in a confectioner's shop); Hull; Manchester (in props for coal mines); Newcastle (on the Quayside, and probably imported with shipping); Scotland, local, amongst Scotch fir logs, Tay, Dee, and Moray districts; in these localities it is sometimes not uncommon where it occurs.

LEIOPUS, Serville.

This genus contains fifty species, which are chiefly confined to the Northern Hemisphere; several, however, have been described from Mexico, Brazil, Peru, Chili, &c.; three species occur in Europe, of which one is found not uncommonly in many parts of Britain; they are allied to *Acanthocinus*, but are very much smaller, and have the antennæ proportionately shorter; the anterior coxæ are only slightly distant, and the thorax is armed with a sharp and somewhat reflexed tooth behind middle; the ovipositor in the female is not exserted; the larva is found under bark of oak, beech, wild pear, &c.; it resembles that of *Acanthocinus*, but is less parallel and rather strongly narrowed behind, the prothorax being half as broad again as the eighth abdominal segment, whereas in *A. ædilis* it is only a fifth part broader; the pupa has the antennæ recurved upon the abdomen and breast as in the last-mentioned species.

L. nebulosus, L. Oblong, black or fuscous black, thickly clothed with greyish pubescence, upper surface mottled with black spots and spaces which are free from pubescence; antennæ long with the base of the joints light; thorax transverse with a small but distinct spine on each side; elytra rather broad, with a sprinkling of black dots and two dark fasciæ, one before and another behind middle, which are exceedingly variable; legs dark, with base of tibiæ and femora ferruginous. L. 5–8 mm.

Male with the antennæ nearly twice as long as the body, and the fifth ventral segment of abdomen shorter than in the female, in which sex the antennæ are only one and a half times as long as the body.

In dead hedges, also on alders and other trees; rather local, but not uncommon in many districts; Dulwich, Richmond, Darent, Westerham, Blackheath, Lee, Caterham, Mickleham, Coombe Wood, Cowfold, Tonbridge, &c.; Hastings; Dover; Portsmouth district; New Forest; Luccombe Chine, Isle of Wight; Glanvilles Wootton; Exeter; Swansea; Llangollen; Talylyn; Bewdley; Sutton Park, Birmingham; Cannock Chase; Tamworth; Repton; Lincoln; Scarborough; Eastham Wood, Liverpool; Northumberland and Durham district; Scotland, scarce, amongst oak trees, Solway, Tweed, and Forth districts; Ireland, near Dublin and Belfast, and probably widely distributed.

POGONCHÆRUS, Latreille.

The members of this genus are small insects with the upper surface more or less uneven; the antennæ are about as long as the body, or a little longer, and have the fourth joint twice as long as the fifth; the thorax has a short spine on each side, and a tubercle on each side of disc; the elytra are uneven, and are gradually narrowed to apex, which is often mucronate, but sometimes only simply truncate; the anterior coxæ are a little distant, and the tibiæ are sparingly pilose; the species at present known are twenty-seven in number, and have been chiefly found in Europe, North America, and Northern Asia; one, however, has been described from Brazil, and one from New Zealand, so that the genus will probably prove to be much more extensive; three of the nine European species are found in Britain; the larva of *P. dentatus* is found under bark and in the wood of decaying boughs of pear and apple trees; it is less narrowed behind than in *L. nebulosus*, the prothorax being only a third part broader than the eighth segment; in most other points it appears to agree closely with it. There is considerable difficulty as to the synonymy of two of our species, as the names *hispidus* and *pilosus* have been applied to both by different authors; to avoid confusion, I have adopted the names of Thomson and Fourcroy; the species themselves are very distinct.

- I. Apex of elytra simply truncate, not mucronate or dentate *P. FASCICULATUS*, De G.
- II. Apex of elytra mucronate at external angles.
 - i. Elytra bidentate at apex, the sutural angle being produced into a short blunt tooth or spine; scutellum white *P. BIDENTATUS*, Thoms.
 - ii. Sutural angle of elytra simple; scutellum dark . . . *P. DENTATUS*, Fourc.

P. fasciculatus, De G. (*fascicularis*, Panz.; *hispidus*, L.). Somewhat convex, fuscous, under-side thickly clothed with greyish-white pubescence, upper-side brownish variegated with lighter brown and whitish pubescence; antennæ rather stout, pilose, with the base of the joints ferruginous; thorax with a smooth tubercle on each side of disc, and a small spine on each side; elytra gradually narrowed from base to apex, which is rather broad and not denticulate, with a lunate whitish-brown fascia on each towards base, and with distinct raised lines; towards apex there are several black spots of hair; legs dark, with the base of femora and tibiæ and a ring in the middle of the tibiæ ferruginous, tarsi pitchy. L. 6–7 mm.

Male with the fifth ventral segment of abdomen deeply impressed and slightly emarginate; in the female the fifth segment is not impressed and rounded at apex.

In boughs and twigs of pine and Scotch fir; rare; Scotland, local, Tay, Dee, and Moray districts (Rannoch, Braemar, Aviemore); Stephens records it from Norwich, but this is probably in error.

P. bidentatus, Thoms. (*hispidus*, Laich. et Brit. Cat.). Fuscous, variegated with white and lighter or darker brown pubescence; antennæ with the base of the joints white; thorax with a tubercle on each side of disc and a spine on either margin; elytra narrowed to apex, which is broad and bidentate, the tooth at sutural angle being short and blunt, and that at external angle long, sharp, and spinose; scutellum clothed with white pubescence; at the base of the elytra there is a conspicuous broad band of white pubescence, a little clouded at shoulder and in middle, extending from base over nearly half their surface; between this and apex there are several black spots or fascicles of hair; legs dark, variegated with red, more or less pubescent. L. $5-6\frac{1}{2}$ mm.

In dead hedges, under bark of apple and pear trees, &c.; local, but not uncommon in many districts; Darenth Wood, Lee, Faversham, Forest Hill, Croydon, Mickleham, Esher, Chatham, Whitstable; Deal; Hastings; Portsmouth district; Glanvilles Wootton; Devon; Swansea; Llangollen; Bewdley; Tewkesbury; Bromsgrove; Birmingham district; Repton; Cheshire; York; Scarborough; Liverpool; Northumberland and Durham district; Scotland, very rare, and perhaps not indigenous, Forth and Moray districts (Sharp); Ireland (Haliday).

P. dentatus, Fourc. (*pilosus*, F.; *hispidus*, Schrank.). Smaller than the two preceding species, fuscous brown, variegated with brownish-white pubescence, of which there is a large curved fascia near base, leaving the part around scutellum usually dark; behind this there are several black fascicles of hair; the species may easily be known by having the sutural angle of elytra simple and the external angle produced into a distinct spine; the elytra are narrower than in *P. bidentatus*, and the pubescence at base is much browner and less conspicuous; in the male the fifth ventral segment of the abdomen is truncate, and rather strongly impressed with a round fovea before apex; in the female the fifth ventral segment is rounded at apex. L. $4-5\frac{1}{2}$ mm.

In hazel twigs, old ivy, crab trees, old hedges, &c.; not uncommon and generally distributed in the London district and the South; Swansea; Llangollen; Coleshill; Knowle; Trench Woods; Bircham Newton, Norfolk; Repton; Yorkshire; Bowdon, near Manchester; Northumberland and Durham district, near Gilsland, on oak hurdles, rare; Scotland, very rare, if indigenous, Solway district; Ireland, near Dublin.

Between the preceding genera and those that follow there intervenes the large and extensive genus *Dorcadion*, Dal., which contains upwards of two hundred species that occur exclusively in Northern and Central Asia and in Europe; there are no fewer than eighty-six found in the latter continent, and in point of numbers it is the most important of the European genera belonging to the Longicornia; the genus, however, is not represented in Britain, nor apparently in Scandinavia, although a fair number occur in Siberia and Russia; a single specimen of *D. fuliginator* was once found in the Tay district of Scotland, creeping over wet seaweed in St. Andrew's Bay, but it was evidently an importation, and was probably introduced in ballast. They are rather stout and robust

insects, with the elytra oval and convex, and the antennæ very robust and comparatively short, not reaching much beyond the middle of the body; the thorax is rather bluntly spined at sides; the anterior coxal cavities are narrowly closed behind, and the legs are rather short and very stout; the average size is from about 12–15 mm.

LAMIA, Fabricius.

This genus only contains one species, which gives its name to the whole family; it is widely distributed in Europe, and is found very locally in Britain in old willows; it is a large and conspicuous species, with the antennæ shorter than the body, robust at base and tapering towards apex, and widely distant at their insertion; the thorax has a strong spine on each side; the anterior coxal cavities are closed behind; the elytra are broad, and the legs rather stout.

The larva of *Lamia textor* is described and figured by Chapuis and Candèze (*Larves des Coléoptères*, p. 245, pl. viii., fig. 1); it is broad in front and narrowed behind, about 40 mm. in length; head small, about a third as broad as prothorax; prothorax about as broad as meso- and metathorax, and as long as these two segments and the first abdominal segment together; antennæ very short; mandibles strong and triangular; legs wanting; abdominal segments nine in number, with the first seven furnished with a transverse oval furrow; anal segment very small; the larva lives in old willows, where it changes to the pupal state, in which it remains for rather more than a month before it emerges as the perfect insect.

L. textor, L. A large and robust species, oblong, rather convex, entirely of a dull fuscous black or black colour, with the under-side moderately thickly clothed with yellowish pubescence; head large, eyes strongly divided, antennæ stout, tapering to apex; thorax transverse, together with head closely rugose, with a sharp spine on each side; elytra broad, coarsely granulate (the granules being rather shiny), and scantily powdered with dots of yellowish pubescence, which in places are confluent, and are often more or less obsolete; legs very stout and comparatively short, black. L. 18–28 mm.

Male with the elytra subtruncate at apex, and the scutellum rather narrower than in the female, in which sex the elytra are obtuse at apex.

In decaying willows; rare; Fairlight, Hastings (Butler); Hampshire; Bath and Bristol (in this locality it has been taken in some numbers); Barmouth; Scotland, local and rare, amongst sallows, Argyle and Tay districts.

MONOCHAMMUS, Latreille.

The two species belonging to this genus which are reputed as British are almost certainly importations; as, however, they are retained in all our catalogues, I have not omitted them; the genus is a very large and important one, containing more than a hundred species, which are widely distributed from Siberia to New Guinea; no species, however, appears to have been described from South America, although one or two have

occurred in Mexico; they are large and conspicuous insects with the antennæ longer than the body, especially in the male, rather robust at base, and gradually tapering to apex; the thorax is armed with a sharp spine on each side, and the anterior coxal cavities are open behind; the elytra are convex, and the legs rather long, with the tibiæ somewhat compressed; about half-a-dozen species have occurred in Europe.

The larva of *M. sartor* is described by Schiödte (Pars ix. p. 435); it is broad in front and considerably narrowed behind, and differs from the majority of the Lamiidæ in being furnished with very minute legs; the anal segment is transverse with the inferior portion sulcate in the middle; it is found in pine wood.

- I. Scutellum entirely clothed with yellowish-white pubescence;
average size larger *M. SARTOR, F.*
- II. Scutellum clothed with whitish or yellowish-white pubescence
with a smooth central line; average size smaller *M. SUTOR, L.*

M. sartor, F. Black, with the elytra slightly æneous; antennæ long; thorax with a lateral spine on each side; scutellum entirely clothed with yellowish-white pilose pubescence; elytra obsoletely impressed transversely in front, rugosely punctured at base, and very obsoletely punctured but thickly pubescent towards apex; in the male the elytra are slightly narrowed to apex and are immaculate, and the antennæ are more than twice as long as the body and black; in the female the antennæ are not much longer than the body and ringed with greyish pubescence, and the elytra are parallel-sided and variegated with a few spots of grey pubescence. L. 18–30 mm.

In timber, and on trunks of trees; very rare, and probably an importation; London, Devonshire, and Norfolk (Stephens); Repton (E. Brown); two specimens from Cambridge Fens (S. Stevens); one specimen taken by a groom in a stable at Boothby Graffoe Rectory, and given to Dr. Power by Miss Fullerton; one in a timber-yard near Taunton; Manchester.

M. sutor, L. Black, rather convex, mottled with pale pubescence on the upper side, and thickly pubescent beneath; rather smaller on the average than the preceding species, and easily distinguished by the fact that the scutellum has a smooth glabrous line in the middle, the rest being clothed with thick whitish pubescence; thorax with a stout acute spine on each side; elytra even, slightly æneous, closely punctured, and together with thorax variegated with a number of spots of yellowish-grey or greyish pubescence, which are more numerous in the female. L. 16–26 mm.

Male with the antennæ more than twice as long as body, black; female with the antennæ a little longer than the body, ringed with white, and with the elytra more thickly spotted with whitish pubescence.

In timber, and on trunks of trees; very rare, and probably an importation like the preceding; Colney Hatch, and Norwich (Stephens); Burton (E. Brown); timber-yard near Taunton; Manchester; Newcastle (one specimen taken in the street) (Dinning).

MESOSA, Serville.

This genus contains a dozen species, which are widely distributed; three are found in Europe, and the remainder have been described from China, Japan, Ceylon, Thibet, the Amazon district, &c.; they are broad and robust insects, and may be distinguished from all the preceding genera of the tribe, to some of which they bear a rather close resemblance, by the fact that the thorax has no lateral spines; the forehead is excavated between the antennæ, and the antennæ are long and pilose beneath; the prosternal process nearly reaches the apex of the anterior coxæ, the cavities of which are narrowly closed behind; the mesosternum is prominent in a blunt tubercle between the intermediate coxæ; the legs are moderately long and robust; the larva of *M. nubila* is found in decaying logs of poplar, lime, beech, &c.; it appears closely to resemble that of *Pogonochærus*, having the prothorax a third broader than the eighth segment of the abdomen, and the anal segment trifurcate; the patterns of the tubercular or scansorial areas of the abdominal segments of various species of Longicorns vary very much, and afford good characters for their distinction; they are, however, hard to describe; those of *M. nubila* and *P. pilosus* will be found figured by Schiödte, Pars ix., Tab. xvii., figs. 20 and 16 respectively, and many others will be found figured by Schiödte and Chapuis and Candèze in their works on the larvæ.

M. nubila, Ol. (*nebulosa*, F.). Short, broad and robust, rather convex, black, variegated with black, brownish-ferruginous and white pubescence; head large, together with thorax marked with longitudinal lines of pubescence, antennæ longer in male than in female; thorax transverse, without spines at sides, coarsely and sparingly punctured; elytra broad, sparingly and closely punctured, with a broad common waved whitish or whitish-brown fascia about middle, bounded above and below by a narrow dark line, that on the posterior margin being strongly dentate; legs pilose, variegated. L. 9–13 mm.

In decaying boughs; rare; most of our specimens have been taken in the New Forest; while I was collecting with Dr. Sharp and Mr. Gorham in that locality on May 1st, 1885, Mr. Gorham took two specimens from a small bough lying on the ground. Monks Wood (not uncommon); Cambridge; Stephens also records it from Coombe Wood, Windsor, and Bewdley Forest.

AGAPANTHIA, Serville.

This genus may be easily known by its elongate form, taken in conjunction with its 12-jointed antennæ, which are longer than the body; the mandibles are bifid at apex; the thorax is not spined at the sides, and the anterior coxal cavities are closed behind, the coxæ themselves being slightly separated; the intermediate tibiæ are slightly sinuate externally towards apex, and the tarsi are long, being almost as long as the tibiæ; the number of species at present known is about thirty,

which are found almost exclusively in Northern and Central Asia and in Europe; one or two, however, have occurred in Algeria; of the sixteen European species one only is indigenous to Britain, although a second, *A. micans*, has been very doubtfully introduced; *A. lineatocollis*, as above pointed out, has the power of emitting a powerful and disagreeable odour, and also of making a strong stridulating noise by moving the thorax up and down, so that it rubs upon the neck of the elytra;* the larva of *A. lineatocollis* is found in the stems of thistles (*Cirsium*); it scarcely differs from that of *A. asphodeli*, which is figured in profile by Perris (*Larves des Coléoptères*, pl. xiii. figs. 5, 18); it is not much narrowed behind, and has the dorsal tubercles rather strongly developed; the legs are wanting, and there is scarcely a trace of ocelli.

A. lineatocollis, Don (*angusticollis*, F.; *Saperda cardui*, Steph.). Elongate, black or pitchy black, pilose, clothed with yellowish pubescence, which is very thick on the under-side; head long, pubescent in front and at sides, and with a thick line on vertex, strongly punctured, antennæ ringed with white; thorax about as long as broad, very slightly narrowed in front, strongly and rather closely punctured, with three strongly-marked longitudinal lines of pubescence, of which the central one continues the line on vertex; scutellum densely clothed with pubescence; elytra coarsely punctured at base, more finely at apex, irrorated with more or less close pubescence, and presenting a finely mottled appearance; legs rather stout, clothed with greyish pubescence. L. 12–18 mm.

Male smaller and more slender, with the antennæ longer than the body and the fifth ventral segment broadly emarginate at apex. Female larger and broader, with the antennæ as long as the body.

On thistles and *Heracleum spondylium*; very local and, as a rule, rare; Darenth Wood and West Wickham Wood; Monks Wood; Norfolk; Weston-on-the-Green, Oxfordshire; Wicken and Burwell Fens; Whittlesea Mere; I have taken it in abundance in Langworth Wood, near Lincoln, on a patch of *Heracleum spondylium*, not yet in flower; on June 11th, 1885, I took fifty specimens, and a few days previously as many as these had been taken in the same ride in the wood. The Rev. J. A. Mackonochie has found it in the same locality this year (1889), but much more sparingly.

SAPERDA, Fabricius.

This genus is closely allied to the preceding, from which it differs in having the antennæ 11-jointed; it contains about fifty species, which are widely distributed throughout the world, and inhabit Europe, North, Central and South America, South Africa, &c.; one or two also have been described from the Australian region; they differ very much in size and general appearance, and have been divided into several subgenera by Mulsant; of the eight European species three are found in

* I am not sure whether this sound is not, in part at least, produced by the friction of the back of the head against the under side of the front of the thorax.

Britain; of these *S. carcharias* is one of our largest Longicorns, and *S. scalaris*, when fresh, is certainly one of the handsomest; the larvæ of our species are found in poplar, aspen, willow, &c.; they are almost parallel-sided, the prothorax being only a seventh part broader than the eighth abdominal segment, and are furnished with very minute legs; the anal segment is trifurcate.

- I. Size very large; elytra thickly clothed with grey or brown pubescence, without distinct bands or patches of a lighter colour *S. CARCHARIAS*, L.
- II. Size moderate; elytra with distinct light bands or spots.
 - i. Thorax strongly depressed before middle and at base; disc almost smooth *S. SCALARIS*, L.
 - ii. Thorax very slightly depressed before middle and at base; disc closely punctured *S. POPULNEA*, L.

***S. carcharias*, L.** (*punctata*, De G.; s.g. *Anærea*, Muls.). One of the largest and most conspicuous of the British Longicorns; black, clothed with yellowish or ashy grey pubescence, which is thicker and longer on the under surface than on the upper, and is somewhat variable in colour, so that the insect appears to vary from quite a light grey to an ochreous yellow; head large, antennæ tapering, with the apical joints not ringed with white; thorax slightly transverse, coarsely and rugosely punctured, with a central line and a tubercle on each side of it, which are usually covered with pubescence; scutellum large, semicircular; elytra broad, with well-marked shoulders, gradually narrowed to apex, which terminates at suture in a short blunt spine, very coarsely and deeply punctured, with a transverse patch of closer pubescence on each about middle; legs short and stout, pubescent, extreme apex of femora usually black. L. 20–28 mm.

Male with the antennæ a little longer than the body, and the elytra more narrowed behind; female with the antennæ a little shorter than the body, the elytra slightly narrowed behind, and the fifth ventral segment of abdomen with a fine channel towards base.

In and about old willows; local and, as a rule, confined to the fen districts, in which formerly it was rather common; Ely; Soham and Wicken Fen, Cambridge; Lincoln; Croncliff, near Scarborough (Wilkinson); also recorded from the Forest of Dean; Scotland, very rare, on aspen, Moray and Sutherland districts; it probably occurs along the whole of the eastern counties from Yorkshire to Norfolk.

***S. scalaris*, L.** A very handsome and conspicuous species, elongate, subparallel, depressed, black, slightly shining, with the under-side densely clothed with bright yellowish-green pubescence; head broad, thickly clothed with bright yellowish-green pubescence, a spot at base being denuded; thorax transverse, coarsely and irregularly punctured, with the disc and a spot at each side bare, the rest being clothed with the same pubescence as head; elytra considerably broader than thorax, with the shoulders strongly marked, very slightly narrowed before apex, with a strong scalariform line of bright yellowish-green pubescence (as on head) running from base to apex, and several patches and spots of the

same between this and margin, upper surface rather coarsely punctured, the spaces between the punctures being finely reticulate; antennæ and legs clothed with more or less distinct greenish pubescence. L. 14–16 mm.

On poplars and aspens; rare; it has chiefly been found in the Manchester district, where it has been taken in some numbers at Agecroft, Pilkington, Middleton, Hough End, &c.; Cockermouth and Langley's pastures, Northumberland and Durham district; Stephens records it as very rare in the neighbourhood of London, but this record is probably erroneous; it must not, however, be rejected without consideration, as I once beat a beautiful specimen, which had evidently just emerged, from alder in Bretby Wood, near Repton, Burton-on-Trent, on July 10th, 1879; it has never occurred in or near the district before or since, and in fact this is the only Midland record;* when quite fresh the insect has a most beautiful golden-green appearance, very different from that of older specimens.

S. populnea, L. Elongate, subcylindrical, villose, black, under-side clothed with thick yellowish-grey pubescence; head as broad as thorax, thickly punctured and pubescent; thorax nearly as long as broad, with three longitudinal lines of yellowish pubescence, the central one being abbreviated and often more or less obsolete, with the punctuation coarse but shallow; scutellum thickly pubescent; elytra with rather scanty yellowish pubescence, and besides with several dots and patches of the same on each, of which one or two in the middle are often most distinct, apex more or less dehiscent, punctuation very coarse; antennæ rather long, ringed with white; legs stout, pubescent. L. 10–14 mm.

On willows, aspens, poplars, willows, &c.; usually in woods; local, but not uncommon; St. James's Park, London; Darenth Wood, Dulwich Wood, Mickleham, Highgate; Hastings; Glanvilles Wootton; Southampton; Bewdley Forest; Knowle, near Birmingham; Chartley Moss and Burnt Wood, Staffordshire; Whittlesea Mere; Repton; Lincoln, Langworth Wood; I know of no record of the capture of this insect further north than the last-mentioned locality, in which I have found it sparingly.

TETROPS, Stephens. (*Polyopsia*, Mulsant.)

Nine species are comprised in this genus; they appear to occur exclusively in Europe, the Caucasus district, and North America; they may be known by having the eyes entirely divided, by their small size, and by their antennæ, which are black and thickly pilose, and not, or scarcely, longer than the body; the anterior coxal cavities are narrowly closed behind, and the tarsi are very short; the larvæ live in decaying wood of various deciduous trees, and the perfect insects are found on flowers.

T. præusta, L. (*ustulata*, Hag.). A very small species, which bears a considerable resemblance at first sight to *Telephorus limbatus*; linear, subcylindrical, with the head, thorax and under-side black, and the elytra testaceous with the apex rather broadly black; pubescence strong and coarse, villose; head as broad as thorax, antennæ stout,

* The species has just been recorded (Ent. Monthly, Mag., Oct. 1889) by Mr. W. G. Blatch, from Sherwood Forest.

black; thorax about as long as broad, transversely impressed in front and behind, with disc nearly smooth and front and sides punctured; elytra strongly and almost regularly punctured; legs testaceous, with the intermediate and posterior femora black. L. $3\frac{1}{2}$ –5 mm.

Male with the antennæ about as long as the body and a little longer than in female, and the forehead furnished with white pilose pubescence.

On flowers, by beating dead twigs, &c.; somewhat local, but not uncommon and generally distributed throughout England from the Midland counties southwards; less common further north; Northumberland and Durham district, rare, Gibside (Wailes); not recorded from Scotland.

STENOSTOLA, Mulsant.

This genus contains five species, which are closely allied to *Phytæcia*, but differ in having the forehead flatter, and the elytra rather pointed at the extreme apex, and without raised lines, and also in the formation of the antennæ and tarsi; two of these have occurred in Europe, and three in North America; one is found very rarely in Britain; the larva of this species seems to differ from most of those that have been noticed in having no visible ocelli; as a rule there appear to be two rather large ones; the legs also are quite wanting, whereas in *Monochammus* and *Saperda* they are visible, although very small; in this point, however, they agree with the majority of the Lamiidæ; the body is considerably narrowed behind, the prothoracic segment being half as broad again as the eighth abdominal segment; the upper surface is rather thickly pilose; the larva is found in boughs of *Salix caprea*.

S. ferrea, Schrank. (*nigripes*, F.; *Saperda ferrea*, Steph.). Elongate, linear, pilose, black, with the elytra of a deep steel-blue or bluish-black colour, thorax sometimes with a metallic reflection; front and sides of head, scutellum, and sides of breast clothed with white pubescence; head broad, antennæ rather long; thorax slightly transverse, nearly as long as broad, closely and rather strongly punctured; elytra with shoulders well marked, coarsely and rugosely punctured; legs black. L. 7–10 mm.

Male with the antennæ a little longer than in female, and the thorax without distinct bands of pubescence; female with the thorax furnished on each side at base with a rather distinct band of whitish pubescence.

On flowers, trees, bushes, &c.; rare; it seems to be particularly fond of the lime. Southsea district; Lords Wood, Southampton; Warwick; Bretby Wood, near Repton (W. Garneys); Matlock, Lovers' Walks (one specimen beaten by myself in June, 1877, from a wild rose bush); Newark; Nottingham; Benthall Edge, Salop (Blatch); Dunham Park, Manchester, on limes (Chappell); Northumberland and Durham district, near Gibside (Hardy); not recorded from Scotland.

PHYTÆCIA, Mulsant.

This genus contains rather more than one hundred species, which are widely distributed in Europe, Northern Africa, and Asia; it does not,

however, appear to be represented in the Old World; it is, as has been above shown, closely allied to *Stenostola*, but may be distinguished by the raised lines on the elytra, which are obliquely truncate and almost emarginate at apex, and, at all events in our species, by having the third joint of the antennæ not much longer than the fourth; the larva is said by Stephens to feed on the inner pith of the twigs of the hazel; more than thirty species have been found in Europe, but only one has occurred, and that very locally and rarely, in Britain.

P. cylindrica, L. (*Saperda cylindrica*, Steph.). Elongate, linear, leaden-black, thickly clothed with greyish pubescence; head very broad; thorax a little longer than broad, and together with head closely and rather strongly punctured, with a central line of whitish pubescence; scutellum also clothed with whitish pubescence; elytra somewhat depressed, coarsely punctured towards base, finely at apex, with two distinct raised lines on each; legs black, with the anterior tibiæ and the greater part of the femora luteous; under-side with greyish pubescence. L. 7–9 mm.

Male with the forehead clothed with whitish pubescence, and the antennæ longer than in female.

On flowers of *Umbelliferæ*, also on hazels; rare; Claygate, Surrey; Cowfold; Chatham; Hertford; Whitstable; Devon; Glanvilles Wootton; Cambridge district; Whittlesea Mere; Repton (W. Garneys); Newark (Hadfield); not recorded from the northern counties of England or from Scotland.

OBEREÆ, Mulsant.

This is a large and important genus, containing upwards of a hundred and twenty species, which are very widely distributed from Siberia to Southern Australia; the genus is very well represented in the Philippines, Borneo, Sumatra, Java, and the Malay Archipelago as far as New Guinea, and species have occurred in Africa and North America, but I do not know of any member of the genus having been described from Central or South America; they are rather large and conspicuous insects, with the antennæ shorter than the body in both sexes, and tapering to apex, and the legs short and stout; the forehead is convex and slightly impressed between the eyes; the anterior coxal cavities are closed behind; the elytra are very coarsely punctured, and are plainly emarginate at apex, the emargination being dentate at each extremity; about a dozen species are found in Europe, of which one only has occurred in Britain; it may easily be recognized by its black head, grey elytra, and red thorax, legs, and under-side, as well as by the strong punctuation of the elytra; its larva feeds in salallows; like that of *Phytæcia* it has no legs or ocelli; the species has chiefly been found in the fen districts, where it used to be taken not uncommonly.

O. oculata, L. Elongate, parallel-sided, with the head and antennæ black, and the mouth, thorax, scutellum, legs, and under-side of a bright yellowish-red colour, the thorax having two rather large, smooth, black

tubercles on disc on each side of the central line; head and thorax rugosely punctured, the latter slightly transverse; elytra emarginate at apex, thickly clothed with greyish pubescence, and with very large black punctures, which are finer at apex; legs short and stout. L. 15–18 mm.

Male with the antennæ about two-thirds as long as body, and the fifth ventral segment of the abdomen broadly and deeply impressed, with the apex slightly emarginate, and the angles at each side of the emargination slightly prominent.

Female with the antennæ about half as long as the body, and the fifth ventral segment of the abdomen with a narrow channel, and the apex truncate.

In and about salallows; rare; Isle of Ely and fen districts of Cambridgeshire generally (Dr. Power and others); near Romney (Dr. Lowe); Stephens records it from Carlisle, Barons Wood, and Scotland; half a century ago it used to be taken not unfrequently in the fen districts, but I know of no captures in these localities in recent years. The capture near Romney is very remarkable; on being informed of it by Mr. G. Lewis, I wrote to Dr. Lowe, who kindly sent me full particulars as follows:—“The insect you mention I took in the autumn of 1883; I was beating everything I came across with an ordinary butterfly-net about a mile from Dymchurch—in fact at St. Mary’s Coast-guard Station. The bank I was searching was close to the sea water, and I daresay had been originally made to keep off the tidal overflow; it was covered with *Hippophaë rhamnoides*, which was in fine fruit, and I can positively declare that I knocked the *Oberea oculata* off the above-named shrub. I looked for some time to find another, and I returned some days after and renewed my search without further success; the place I have indicated is not far from Romney, and it forms part of Romney marshes; considering the known habits of the insect, I think there is little doubt but that it was carried by chance to the spot I have described, and that if I had gone to the marshes and ditches which abound for miles I should have taken more, but I did not then know its habits.” *

A chance occurrence of an insect like this in a locality quite distinct from any previously recorded serves to show how very little we really know as to the distribution of some of our most conspicuous insects.

PHYTOPHAGA.

This series contains a very large number of conspicuous and brightly coloured insects of various forms and sizes, the greater number, perhaps, being oval or rotundate-oval, and very convex; in several of the families, however, the shape is more or less elongate, and a large number of species are darkly-coloured and inconspicuous; the few groups and families have a general appearance about them (or *habitus*, as some authors call it) which is usually unmistakeable; in spite of this, however, they are exceedingly difficult to define or separate on any distinct characters, and any attempt to do so will be found very unsatisfactory; some authors include the Longicornia under the group, and a large number omit the Bruchidæ; these latter are now generally regarded as coming nearest to the *Sagrina*, although not exactly agreeing with any

* Since the above was written, I have been informed by Mr. J. J. Walker that the species was taken last summer (1888) by Mr. Frank Norgate, near Downham Market, Norfolk.

group of the Coleoptera, and the remainder of the Phytophaga, or Phytophaga proper, fall fairly naturally into four groups, which are however, as before remarked, hard to differentiate by fixed characters; the Bruchidæ may be distinguished from all the other members of the series by having the mentum supported by a peduncle, and the head produced into a very short flat rostrum, and omitting this family as somewhat provisionally placed in its present position, we may separate the remaining divisions as follows:—

I. Front not or only slightly inflexed; mouth anterior.

i. Head constricted into a neck behind eyes; thorax with the sides not margined, usually narrower than elytra; form elongate

EUPODA.

ii. Head not constricted into a neck behind eyes; thorax with the sides nearly always margined, usually as broad as elytra; abdomen with the two last segments connate; form cylindrical or short cylindrical

CAMPTOSOMATA.

iii. Head without or with a very short neck; thorax with the sides nearly always margined, usually as broad as elytra; abdomen with the segments free; form usually ovate or subglobose, very rarely elongate-oblong

CYCLICA.

II. Front strongly inflexed; mouth inferior CRYPTOSTOMATA.

In dealing with the Phytophaga, I have made considerable use of the work of Herr Weise in the *Naturgesichte der Insecten Deutschlands*, vol. vi., and beg here to express the obligations that I am under to his writings on the group.

BRUCHIDÆ.

(*Mylabridæ*, Heyden, Reitter, and Weise, Cat. p. 179.)

The position of this family has given rise to much dispute; by most authors it has been placed either in or near to the Rhynchophora, in close proximity to the Anthribidæ; thus Fabricius places it between *Hylesinus* and *Anthribus*, Gyllenhal between *Anthribus* and *Attelabus* (*Apoderus*), while Thomson assigns it a position at the commencement of his series Rhynchophori, immediately succeeding the Heteromera; externally the members of the tribe certainly appear to be closely allied to the Anthribidæ, but their real affinities appear to be rather towards the Phytophaga; Dr. Horn defines the Bruchidæ as “Chrysomelidæ with the submentum distinctly pedunculate” (Classification of the Coleoptera of North America, p. 357); and points out how Lacordaire (Genera, vii. p. 598), while following the usual arrangement, admits that the characters are rather those of the Chrysomelidæ, and that the two families are so closely related that he is unable sharply to separate them; M. Bedel (Faune des Coléoptères du bassin de la Seine, Rhynchophora, p. 4), in dealing with the Urodontidæ, says, “This little group forms a transition between the Rhynchophora and the Phytophaga by its

analogy with the *Bruchidæ* ;” the genus *Urodon* has always been associated with the *Bruchidæ*, and in great measure owing to this the family has been connected with the *Anthribidæ* ; M. Bedel has, however, shown that by the structure of the under side of the head and thorax the genus is really *Anthribide*, whereas the *Bruchidæ* have rather the structure of the *Phytophaga*. It must, however, be allowed that, as a matter of fact, the family is not very closely allied to any other group, but appears to come closer to the *Sagrina* than to any other members of the *Coleoptera* ; it is therefore best placed at the beginning of the *Phytophagous* series in immediate proximity to the last-mentioned tribe.

The following are the chief characters of the *Bruchidæ* :—Head free, produced in front, but with no distinct rostrum, mentum supported by a peduncle, neck usually constricted, antennæ 11-jointed, not clavate, but often serrate or pectinate, and more or less thickened towards apex ; eyes emarginate ; maxillæ exposed at base, bilobed, with 4-jointed palpi ; thorax margined at the sides, the margins being sometimes obsolete, variable in shape ; anterior coxæ conical and oblique, contiguous at apex, posterior coxæ large, laminate, contiguous or slightly distant, reaching the margin of elytra ; mesosternum short, separating the middle coxæ, which are oval ; elytra entire or truncate, pygidium always exposed ; abdomen with five free ventral segments, of which the first is the longest ; posterior femora more or less thickened ; tarsi with the first joint elongate, the third bilobed, and the fourth very small and closely united with fifth ; claws toothed at base.

The larvæ of the *Bruchidæ* are soft white fleshy grubs with a scaly head and strong short jaws, with the legs obsolete or very short ; that of *B. ruficornis* is figured by Westwood (Classification, vol. i. p. 324, fig. 40, 7) ; they are exceedingly destructive to leguminous seeds, especially beans and peas, and in tropical climates do great damage to the grains of the *Gleditzia*, *Mimosa*, *Acacia*, *Theobroma*, and other plants ; some species also appear to attack cocoa-nuts and palm-nuts ; in our country the attack of species of *Bruchus* is sometimes very serious to the pea and bean crop ; the beetles appear to lay their eggs in the peas and beans while yet in the pod and soft ; the larvæ when hatched devour the inner surface of the seed, but have the curious instinct to leave the germ untouched ; the seed therefore will sprout and grow, but, as has lately been proved by Mr. Theodore Wood in a series of experiments, the plants are either sickly and bear scarcely any pods, or the pods are almost barren ; the larvæ change to the pupal state inside the seeds, and usually remain in this condition through the winter, appearing in spring as perfect beetles ; remedies against the pest are hard to suggest, and the best that can be suggested is to buy the seed from well-known growers, and carefully avoid “cheap seed,” which in all cases, but especially in that of peas and beans, will inevitably be found the dearest in the long run. Miss Ormerod (Manual of Injurious Insects, p. 11) suggests the adoption of one remedy practised in the Colonies for the destruction of weevils in rice by exhausting the air ; a quantity of rice is put in a tank with a lighted candle or lamp set on the surface, and the tank is then hermetically sealed ; on the tank being opened some hours afterwards, a large number of beetles will be found to have been killed.

In the Munich catalogue published in 1873 five genera and four

hundred and twelve species are enumerated as belonging to this family, including the genus *Urodon*; the number has, however, been considerably increased since that time, and several new genera have been added; four genera (*Rhæbus*, *Kytorhinus*, *Spermophagus*, and *Bruchus*) are found in Europe, represented by a hundred and fifty-one species, of which all but nine belong to *Bruchus*; this latter genus is the only one that is represented in Britain. The revivers of old names have played havoc with the nomenclature of the family, and certainly produced a confusion that is a *reductio ad absurdum* of their system; *Bruchus*, according to them, becomes *Mylabris*, and the family is termed Mylabridæ; the well-known *Mylabris* thus requiring a new name is called *Zonabris*; and worse than all, the Ptinidæ are named Bruchidæ, and our familiar *Ptinus* is changed to *Bruchus*.

BRUCHUS, Linné *et auct.*

This genus contains upwards of four hundred species, which are widely distributed throughout the world, both in temperate and tropical countries; the real distribution of the majority of the species can hardly be known, as so many have been conveyed from one country to another by commerce, and then been naturalized; about one hundred and forty are found in Europe, of which thirteen occur in Britain; several of these are, however, almost undoubted importations; they are in a few cases rather hard to determine from descriptions, some of the characters, such as that of the lateral teeth of the thorax, not being at first sight very obvious; the head is projecting and is constricted behind, and the antennæ are more or less strongly thickened and often very distinctly serrate; the posterior tibiæ are usually, but not always, toothed before apex, and the first joint of the posterior tarsi is very much elongated and more or less curved; the margins of the thorax are very narrow and often scarcely apparent and concealed by pubescence, with which, in many cases, the colour of the upper surface is much variegated.

- I. Prevailing colour of elytra bright brown or reddish-brown; antennæ pectinate in the male B. PECTINICORNIS, L.
- II. Prevailing colour of elytra black or greyish; antennæ not pectinate in the male.
 - i. Thorax at least as long as broad, strongly narrowed in front, conical; antennæ entirely black.
 - 1. Form less elongate; pubescence comparatively scanty B. CISTI, F.
 - 2. Form more elongate; pubescence thick, so that the upper surface is quite grey B. CANUS, Germ.
 - ii. Thorax transverse or subtransverse, more gradually narrowed in front; antennæ with at least the base red or reddish.
 - 1. Thorax with a more or less distinct tooth at sides.
 - A. Legs more or less red.

- a. Anterior femora entirely, or almost entirely, black B. PISI, *L.*
- b. Anterior femora entirely, or almost entirely, red.
 - a*. Lateral teeth of thorax strong . . . B. AFFINIS, *Fröl.*
 - b*. Lateral teeth of thorax feeble.
 - a†. Antennæ with the first four joints red.
 - a‡. Size larger; elytra strongly variegated with whitish pubescence; pygidium usually with dark spots . . . B. RUFIMANUS, *Boh.*
 - b‡. Size smaller; elytra indistinctly variegated with whitish pubescence; pygidium without dark spots . . . B. ATOMARIUS, *L.*
 - b†. Antennæ wholly red or with the first five joints red.
 - a‡. Anterior and intermediate legs entirely red; antennæ, as a rule, entirely red B. LUTEICORNIS, *Ill.*
 - b‡. Anterior and intermediate femora more or less infusate (the intermediate pair being almost entirely dark); antennæ dark, with the first five joints red B. RUFIPES, *Herbst.*
(*nubilus*, *Boh.*)
- B. Legs entirely black B. VICIÆ, *Ol.*
- 2. Thorax without tooth at sides.
 - A. Posterior femora with a distinct tooth before apex.
 - a. Upper surface with scanty and evenly distributed pubescence; intermediate legs black . . . B. LOTI, *Payk.*
 - b. Upper surface with very thick, strong and uneven, and somewhat variegated pubescence; intermediate legs, except femora, red . . . B. LENTIS, *Boh.*
 - B. Posterior femora not toothed; legs entirely black B. VILLOSUS, *F.*
(*ater*, *Marsh.*)

B. pectinicornis, *L.* (*chinensis*, *L.*; *scutellaris*, *Steph.*). Ovate, pitchy red or reddish-brown, clothed with rather thick pubescence; antennæ rather long and comparatively slender, pectinate in male, rather feebly serrate in female; thorax a little broader than long, broadest at base, gradually rounded and narrowed in front, without distinct lateral teeth, infusate, with whitish-grey pubescence, especially at base, the central line and a small spot on each side of it being also whitish; scutellum clothed with whitish pubescence; elytra reddish-brown, darker towards base and sides, irregularly but thickly pubescent, with fine and remote punctured striæ; pygidium clothed with thick greyish-white pubescence, with two larger or smaller bare spots; legs dull red, femora sometimes darker at base; under-side very thickly pubescent. *L.* $2\frac{1}{2}$ – $3\frac{1}{2}$ mm.

Rare, and probably an importation, although it is recorded by Stephens as found on *Heracleum spondylium* in Penge Wood; Old Brompton, crawling on a gate

(Waterhouse); Scarborough (Lawson and Wilkinson); Salford and Manchester, in granaries (Chappell); the species is almost cosmopolitan in its distribution.

B. cisti, F. Oblong ovate, black, clothed with fine and scanty pubescence, not variegated; antennæ stout, serrate; thorax finely and closely granulate, long and strongly narrowed in front, conical, about as broad as head at apex, and about as broad as elytra at base; elytra with distinct and strong striae, interstices very finely punctured; legs black, posterior femora not toothed. L. $1\frac{1}{2}$ – $1\frac{3}{4}$ mm.

Chalky and sandy places; on *Helianthemum vulgare*, &c.; local, but not uncommon in some districts, Caterham, Birch Wood, Mickleham, Dorking, Kenley (Surrey), Shirley, Darenth, Chatham, Maidstone, Reigate, Esher, Eassey (Kent); Portsmouth district; Winchester; Glanvilles Wootton; Powderham, Devon (on broom); Bristol; Rodborough, Gloucestershire.

B. canus, Germ. This species is by many authors identified with the preceding, but may be easily known by its more elongate form, and much thicker pubescence, which gives the insect a uniform grey colour; the striae also of the elytra are finer, and the formation of the antennæ and thorax are slightly different; in other points it closely agrees with *B. cisti*. L. $1\frac{1}{2}$ –2 mm.

On *Onobrychis sativa* (Common Sainfoin); rare; Caterham, Mickleham, and Chatham (Champion); Darenth Wood and Gravesend (Power); Winchester (Gorham); it has also occurred at Strood, Riddlesdown, and Brighton, I believe in each instance to Dr. Power.

B. pisi, L. (*pisorum*, L.). One of the larger species, oblong ovate, black with the four basal joints of the antennæ, the anterior tibiae and tarsi, the apex of the intermediate tibiae, and the intermediate tarsi red; head with a strongly marked raised central line, vertex with brownish pubescence, antennæ strongly thickened; thorax rather strongly sculptured, subparallel towards base, gradually narrowed in front, transverse, with variegated brownish and white pubescence, base with a distinct white spot before scutellum; scutellum greyish-white; elytra mottled with bands and patches of brownish and white pubescence, moderately strongly striated, interstices broad distinctly punctured, pygidium thickly clothed with whitish pubescence with two large bare ovate spots; posterior femora toothed. L. 4–5 mm.

A cosmopolitan species; found in peas, &c., in warehouses; London, Walworth, &c.; Guildford; Birmingham and Knowle; Manchester (general in shops and granaries); Scotland, not indigenous, Solway and Clyde districts; Mr. Chappell records it as taken at Stretford near Manchester on *Sisymbrium*.

B. rufimanus, Boh. Very closely allied to the preceding, which it strongly resembles in general appearance; it may, however, be easily known by having the anterior femora (which are black in *B. pisi*) entirely red; the thorax, moreover, is evidently longer and more closely and finely punctured, and the tooth on the posterior femora is shorter and more obtuse; the pygidium is almost entirely covered with whitish-grey

pubescence, the black spots being small, obsolete, or even absent. L. 3-4 mm.

On beans; generally distributed throughout the greater part of England, and often found in profusion; Dr. Sharp records it as found in the Solway, Forth, and Tay districts of Scotland, but as imported in beans and not indigenous; Ireland, near Belfast, and probably widely distributed; the species may have been originally imported, but it occurs in the country at a distance from granaries, as well as in warehouses.

B. affinis, Fröl. (*flavimanus*, Boh.). In size and general appearance this species strongly resembles the two preceding, but is more closely allied to *B. pisi*, which it resembles in its shorter thorax, the colour of the pygidium, and the sharp tooth of the posterior femora; the latter, however, is much shorter than in the last-mentioned species; from both *B. pisi* and *B. rufimanus* it may at once be known by the very strong and projecting lateral teeth of the thorax, which cause the sides to appear as if excised before base, and also by the finer sculpture on the thorax and elytra; the antennæ are black with the first four joints red, and at least the anterior tibiæ and tarsi, the intermediate tarsi, and the apex of the intermediate femora are red. L. 3-4 mm.

Imported in beans, and not indigenous; rare; Bearsted near Maidstone and Barking (Power); Sydenham; Stretford, near Manchester (Chappell); Scotland, Solway district.

B. atomarius, L. (*granarius*, L.; *seminarius*, Sharp's Cat.). Obovate, black, with the thorax and elytra variegated with white pubescence in scanty spots, with a patch before scutellum and at base of suture; scutellum white; antennæ black with the first four (rarely three) joints red; thorax gradually narrowed in front, slightly sinuate at sides, with indistinct lateral teeth, closely punctured, with the base produced in centre into a lobe which is almost emarginate; elytra with rather strong striæ, interstices broad, very closely punctured; legs black, with the exception of the anterior pair which are usually entirely red, except the tarsi, but occasionally have the femora and even the tibiæ more or less infuscate; posterior femora with a small tooth on under side; male with the intermediate tibiæ armed with a small tooth before apex. L. $2\frac{1}{2}$ -3 mm.

On flowers; not uncommon in some districts, but local; Caterham, Mickleham, Croydon, Claygate, Cowfold, Horsell, Rusper, Bearsted near Maidstone, Chatham, Faversham, Dartford, Whitstable; Folkestone; Hastings; Faygate, Sussex; Holm Bush, Brighton; Portsmouth district; Weymouth; Glanvilles Wootton; Devon; Stretford, near Manchester; Ireland, near Waterford (Power), and common near Armagh (Johnson).

B. luteicornis, Ill. Ovate, rather depressed, black variegated with grey or greyish-white pubescence, which is distributed in small patches, a spot at base of thorax and another at base of suture of elytra being most conspicuous; scutellum also covered with pubescence; in fresh specimens the elytra have a double greyish interrupted line on the

middle; the abdomen, as in several other allied species, has white points at the sides; antennæ, as a rule, entirely red; thorax rather gradually narrowed in front, without distinct tooth at sides; anterior and intermediate legs red; posterior femora distinctly toothed. L. $2\frac{2}{3}$ mm.

On *Leguminosæ*; rare; recorded somewhat doubtfully from Claygate and Ashted, Surrey, by Mr. Champion; Claygate (Power); Southend; Maldon, Essex; Guestling, near Hastings; Portsdown Hill, near Portsmouth; Isle of Portland.

B. rufipes, Herbst. (*nubilus*, Boh.). This species has been considered by some authors to be identical with *B. luteicornis*, but appears to be more closely allied to *B. atomarius*, from which it may easily be known by having the anterior and intermediate legs red, except the base of the anterior femora and the intermediate femora from near apex, which parts are black; the antennæ, moreover, have the first five joints red, the rest being black, and the thorax is subparallel at sides and gradually rounded in front, the apex being almost as broad as the base; in shape the thorax much resembles that of *B. pisi*; these characters will also distinguish the species from *B. luteicornis*; the upper surface is rather strongly variegated with brownish and greyish pubescence, which is especially apparent on the base of thorax, the scutellum, and the disc of elytra; the pygidium has two more or less pronounced bare spots; the posterior femora are evidently toothed beneath. L. 3 mm.

On *Leguminosæ*; very rare; three specimens taken by Dr. Power at Surbiton and Gravesend in June, 1869, are all, apparently, that have occurred in Britain.

B. viciæ, Ol. (*nigripes*, Gyll.; *punctellus*, Boh.). This species appears to be intermediate between *B. luteicornis* and *B. loti* in general structure, but may easily be known from both and from all our black species in which the elytra are variegated with whitish pubescence by having all the legs entirely black; the antennæ have the first four joints reddish, the colour being often obscure, with the second joint distinctly smaller than the third; the thorax has a small tooth at sides, and is very closely but rather distinctly sculptured; the posterior femora are armed with a rather strong and large, but somewhat blunt tooth before apex. L. $2\frac{1}{2}$ –3 mm.

Very rare; two specimens only have been recorded as British; these were taken by Dr. Power at Hurst and the Devil's Dyke, Brighton, in May, 1869; it has doubtfully been recorded from Caterham, but apparently the record was in error, as it has not been confirmed.

B. loti, Payk. (*lathyri*, Steph.). Obovate, black, evenly clothed with greyish pubescence; antennæ stout, black, with the first four joints red; thorax narrowed in front, scarcely visibly sinuate at sides, without lateral tooth, finely and very thickly sculptured; scutellum and a patch at base of suture often whitish; elytra broad, depressed on disc, with strong striæ, interstices very finely punctured; anterior legs red,

the rest black; posterior femora with a strong and distinct tooth before apex; in the male the intermediate tibiæ are furnished internally with a bifid process at apex; occasionally the intermediate femora are red at apex. L. 2–3 mm.

On *Lotus corniculatus*, *Lathyrus pratensis*, &c.; local, but not uncommon in some districts; Caterham, Mickleham, Forest Hill, Tonbridge, Darenth, Birch Wood, Claygate, Cowfold, Chatham, Sheerness, Whitstable, Maidstone; Herne Bay; Hastings; Portsmouth district; Isle of Wight; New Forest; Glanvilles Wootton; Bristol; Bewdley Forest; Trench Woods; Hertford; Rudham, Norfolk; Doverscourt.

B. lentis, Boh. Ovate or oblong ovate, somewhat depressed, black with the upper surface clothed with light brown and greyish pubescence, which is very thick, and gives the insect a somewhat variegated greyish-brown appearance; antennæ short, with the first four or five joints red; thorax rather broad, subparallel towards base, rounded and narrowed in front, without tooth at sides, closely but distinctly punctured; elytra with moderate striæ, pygidium with dark spots very little marked in fresh specimens, and consisting of brownish pubescence; anterior legs entirely and tibiæ and tarsi of intermediate legs reddish-yellow; posterior femora with a distinct sharp tooth before apex. L. $2\frac{3}{4}$ – $3\frac{1}{2}$ mm.

Very rare; three specimens taken by Dr. Power at Birch Wood and Gravesend in May and June, 1869, and one by Mr. Chappell at Stretford, near Manchester, appear to be all that have been recorded as British.

B. villosus, F. (*ater*, Marsh.). Ovate, black, clothed with thin and even greyish pubescence; antennæ rather long, black with the base ferruginous, the colour being often obscure, gradually thickened; thorax gradually and rather strongly narrowed in front, closely punctured, without teeth at sides; elytra broad and depressed, rather shining, with distinct striæ, interstices closely and finely punctured; legs black, posterior femora not toothed; the species somewhat resembles *B. cisti*, but may be easily known by its shorter and broader form, very differently shaped thorax, and more slender antennæ, of which the base is more or less distinctly ferruginous. L. $2\frac{1}{4}$ – $2\frac{2}{3}$ mm.

On *Leguminosæ*, *Helianthemum vulgare*, broom, &c.; locally common; Shirley, Weybridge, Mickleham, Forest Hill, Woking, Weybridge, Horsell, Boundstone, Darenth Wood, Coombe Wood, Tonbridge, Sevenoaks, Chatham, Whitstable; Herne Bay; Sandwich; Hastings; St. Leonard's Forest; Portsmouth district; Shirley Warren, Southampton; Isle of Wight; Kidderminster; Bewdley Forest; St. Faith's, Norwich; Rudham, Norfolk; Colchester; Ireland, near Waterford (Power).

EUPODA.

The members of this group are chiefly distinguished by having the head constricted into a more or less distinct neck behind the eyes, and the sides of the thorax not margined; the antennæ are filiform or moniliform, and are inserted at a greater or less distance from one another; the head is rather projecting, with prominent eyes which are entire or emar-

ginate; the thorax is as long as or longer than broad, much narrower as a rule than the elytra, the latter being more or less elongate, and often more or less narrowed towards apex; the legs are long, and the posterior femora are often produced a long distance beyond the sides of the elytra, and are in many cases armed with teeth; the anterior coxæ are exserted and conical-globose, and the anterior coxal cavities are nearly always closed behind; the group may be divided as follows into three tribes:—

- I. Prosternum distinct between anterior coxæ; posterior coxæ almost contiguous; first ventral segment of abdomen evidently longer than second; apex of mandibles entire **SAGRINA.**
- II. Prosternum very narrow between anterior coxæ, which are almost contiguous; apex of mandibles more or less split.
 - i. First ventral segment of abdomen as long as or longer than all the rest taken together; antennæ somewhat approximate at base; posterior coxæ widely separated **DONACIINA.**
 - ii. First ventral segment of abdomen, as a rule, scarcely longer than second; antennæ distant at base; posterior coxæ moderately separated **CRIOCERINA.**

SAGRINA.

This tribe contains sixteen genera and upwards of one hundred species; some of these are large and very conspicuous insects; this is especially the case with the genus *Sagra*; in this genus the hind legs are very strongly developed, so that the species might be thought at first sight to be very large Halticidæ; they appear, however, to use these legs for suspension, and to drop on the least alarm; only one genus, represented by two species, is found in Europe; both of these occur rarely in Britain.

ORSODACNA, Latreille.

This genus, as at present known, contains fourteen species, which are found in Europe, Central Asia, Ceylon, North America, and Chili; they are rather elongate insects with the eyes entire, large, round and prominent, and the thorax much narrower than the elytra and contracted behind; the elytra are subparallel and the legs are moderately long, with the apex of the tibiæ spined and the tarsal claws armed with a sharp tooth; the two British species may be distinguished as follows:—

- I. Upper surface glabrous or almost glabrous, less thickly punctured **O. CERASI, L.**
- II. Upper surface with thick and rather long pubescence, more thickly punctured **O. LINEOLA, Panz.**

O. cerasi, L. A very variable species as regards size and colour, elongate, with the upper surface almost glabrous and the under-side thickly pubescent; thorax subcordate, sparingly punctured, together with the head usually rufo-testaceous; the colour, however, is sometimes darker, and the suture and sides of elytra and more or less of the

under-side is often dark, the remaining parts being lighter or darker rufous or testaceous ; occasionally the whole body is dark with the antennæ and legs fuscous ; antennæ moderately long, reddish ; scutellum smooth ; elytra more thickly and strongly punctured than thorax ; legs moderately long, testaceous. L. $4\frac{1}{2}$ –8 mm.

On whitethorn blossom, Umbelliferæ, &c. ; rare ; Epping Forest ; Coleford, Gloucestershire (Power) ; Matlock, Lovers' Walks, not uncommon ; I have found it on the only two occasions I have collected in this locality, and Stephens records it as having been taken plentifully in the district ; Ripon (Waterhouse) ; Yorkshire (Blatch).

Our specimens seem chiefly to belong to the *var. chlorotica*, Latr., which has the under-side, and usually the upper side, entirely testaceous, and the *var. lineola*, Lac., in which the under-side, vertex, suture, and lateral margin of elytra are dark ; the *var. glabrata*, F., which is entirely black, with the antennæ and legs fuscous, has not, as far as I know, occurred in Britain.

O. lineola, Panz., *nec* Lac. (*nigriceps*, Brit. Cat.). This species much resembles the preceding, and, like it, is very variable in size and colour ; it may, however, be known by the rather long pubescence of its upper surface, which is more thickly punctured ; the thorax is longer, and the under-side is more sparingly punctured and pubescent ; the elytra in both this and the preceding species are sometimes broad and rather flat, and sometimes narrow and convex ; the head and breast are usually, but not always, black. L. 4–7 mm.

On sallows, whitethorn blossom, &c. ; rare ; Ashted (Blatch) ; Gravesend ; Darenth ; New Forest (Power) ; Matlock ; very common in a wooded valley on the Yorkshire Wolds on *Spiræa ulmaria* in July (Allen Harker).

V. humeralis, Latr. Deep violaceous-blue, almost black, with two red spots towards base of thorax and the shoulders of elytra reddish ; the upper surface is sometimes immaculate.

On the blossom and in the decaying wood of the whitethorn ; rare ; Ashted (Champion) ; Coombe Wood (1837) and Norwood (1887) (S. Stevens) ; Darenth (Power) ; New Forest (Stephens, Power, &c.).

DONACIINA.

This tribe contains two genera, *Donacia* and *Hæmonia*, which are chiefly found in cold and temperate countries ; they are characterized by having the head prominent and somewhat narrowed behind the eyes, the antennæ long and slender and not very distant at base, the thorax quadrate, much narrower than the elytra, which are punctured in distinct rows, and the posterior coxæ widely distant ; the first segment of the abdomen is equal to the rest taken together ; the tibiæ are compressed on their exterior margin, and are more or less distinctly carinate,

and the tarsal claws are large and strong and simple ; the under-side of the body is clothed with very thick silvery pubescence which repels water; the two genera may be distinguished as follows :—

- I. Upper surface metallic; elytra not produced into a spine at apex; tarsi with the three first joints dilated and strongly pubescent beneath DONACIA, F.
- II. Upper surface not metallic; elytra produced into a strong spine at their external apical angle; tarsi with the three first joints narrow and not pubescent beneath HÆMONIA, Curt.

DONACIA, Fabricius.

This genus contains about ninety species, which are chiefly found in Europe, Northern Asia, and North America; a few, however, have been described from India, Java, Cuba, &c.; there are thirty European species, of which nineteen are found in Britain; they may be easily known by their brilliant metallic appearance and silvery under surface; the upper surface is often variegated with brilliant red and purple markings; they are gregarious in their habits, and are found on the leaves and stems of various water plants.

The larva of *D. sagittariæ* is figured by Chapuis and Candèze (Cat. des Larves des Coléoptères, pl. ix. fig. 1); it is of a dull white colour, with the head, mouth parts, and prothoracic scutum yellow; the form is subcylindrical, narrower in front, and widened very gradually behind, the greatest breadth being at about the fifth abdominal segment; the head is very small and retractile, with five ocelli on each side; the prothorax is longer but narrower than the mesothorax, and is armed with a somewhat corneous scutum; the abdominal segments are eight in number, and are each divided on their upper surface into two parts by a transverse furrow, each part being furnished with a broad band of hairs directed backwards; the eighth segment is almost completely sunk in the seventh, and is furnished near its apex on the upper side with two ferruginous triangular hooks; the antennæ are very short, 4-jointed, and the legs are short and slender, and not or scarcely visible from above. The eggs of the Donaciæ are arranged in rows on the lower side of the leaves of water plants (such as *Scrophularia*, *Nymphaea*, *Potamogeton*, &c.; when the young larvæ are hatched, they take up their abode in the stems of these plants, in which they become full grown in four or five months; in autumn they go down to the roots, and there form an oval cocoon which they attach to one side of the roots or filaments, forming knots along the stems; the pupa calls for no particular remark, and soon changes to the perfect insect, which, however, passes the winter in the cocoon, and does not leave it until May or June in the following year.

Our British species may be distinguished as follows :—

- I. Tibiæ not produced externally into a tooth at apex; apex of mandibles only slightly projecting beyond labrum; first segment of abdomen longer than the rest taken together (*Donacia*, i. sp.).
 - i. Thorax and elytra without pubescence.
 - 1. Posterior femora of male armed with two teeth on their under-side.

- A. Disc of thorax finely or very finely strigose, not or scarcely punctured.
 - a. Posterior femora very long, reaching apex of elytra; posterior tibiae of male with prominences on their inner side; average size larger D. CRASSIPES, *F.*
 - b. Posterior femora shorter, not reaching apex of elytra; posterior tibiae of male without prominences; average size smaller D. SPARGANII, *Ahr.*
- B. Disc of thorax more or less plainly punctured and coarsely strigose.
 - a. Elytra broader and less narrowed behind; posterior femora of female with only one small tooth D. VERSICOLOREA, *Brahm.*
(*bidens*, Ol.)
 - b. Elytra narrower and more narrowed behind; posterior femora in female with two teeth, the inner one being small . . . D. DENTATA, *Hoppe.*
- 2. Posterior femora of male with one tooth on their under-side.
 - A. Posterior femora longer, reaching apex of elytra, each of which is furnished on each side with one impression before middle near suture, and a broad longitudinal purple-red stripe (sometimes more or less obsolete) near suture D. DENTIPES, *F.**
 - B. Posterior femora shorter, not reaching apex of elytra, which are furnished with two or more distinct impressions.
 - a. Elytra with a longitudinal band at sides, and a spot at base purple red D. LIMBATA, *Panz.*
(*lemnæ*, F.)
 - b. Elytra unicolorous, or slightly darker on disc, without distinct bands or markings.
 - a*. Interstices of striae of elytra rather thickly set at base with large punctures; average size larger.
 - a†. Upper surface golden green; elytra with six well-marked impressions on each, situated both near suture and at sides; central furrow of thorax deeper D. BICOLORA, *Zsch.*
(*sagittariæ*, F.)
 - b†. Upper surface obscure brownish-bronze, with distinct impressions near suture, and at most one distinct longitudinal impression at sides; central furrow of thorax less marked D. OBSCURA, *Gyll.*

* The name *D. aquatica*, L., ought, apparently, to be applied to this insect, but the name *aquatica* has been given to so many of the species that it is best omitted altogether.

- b*. Interstices of elytra at base not, or scarcely, punctured; average size smaller.
- a†. Form more elongate; upper surface duller and less evidently impressed; teeth of posterior femora sharp and distinct D. THALASSINA, *Germ.*
- b†. Form shorter; upper surface more shining and more evidently impressed; teeth of posterior femora indistinct D. IMPRESSA, *Payk.*
3. Posterior femora of male without teeth.
- A. Elytra sharply truncate or emarginate at apex, with both the apical angles well marked.
- a. Elytra without reddish-purple stripe near suture; anterior angles of thorax more prominent D. SIMPLEX, *F.*
(*linearis*, Hoppe.)
- b. Elytra with a reddish-purple and blue stripe near suture; anterior angles of thorax less prominent D. VULGARIS, *Zsch.*
(*typhæ*, Ahr.)
- B. Elytra obtusely truncate or separately rounded at apex, the exterior angles at least being rounded.
- a. Length 7-12 mm.; thorax transversely wrinkled, shining, sometimes almost smooth D. CLAVIPES, *F.*
(*menyanthidis*, F.)
- b. Length 6-9 mm.; thorax closely and strongly punctured D. SEMICUPREA, *Panz.*
(*simplex*, F. (*Syst. El.*)).
- ii. Upper surface thickly pubescent; posterior femora without teeth, and not reaching apex of elytra D. CINEREA, *Herbst.*
(*hydrochæridis*, F.)
- II. Tibiæ produced externally into a tooth at apex; mandibles stout, projecting considerably beyond labrum; first segment of abdomen equal to, or rather shorter than, the remainder taken together. (*S.g. Plateumaris*, Thoms.)
- i. Elytra with impressions; legs metallic, unicolorous with body; posterior femora with a strong triangular tooth in both sexes.
1. Antennæ longer, with the third joint longer in proportion; anterior angles of thorax acute and reflexed, and the callosity near these angles clearly defined D. SERICEA, *L.*
2. Antennæ shorter, with the third joint shorter in proportion; anterior angles of thorax rounded and deflexed, and the callosity near these angles less distinctly defined D. DISCOLOR, *Panz.*
(*comari*, Suff.)
- ii. Elytra without impressions; legs red; posterior femora with a strong tooth in male and a feeble tooth in female.

1. Size larger; elytra with the interstices coarsely rugose, black or purplish-black in both sexes *D. BRACCATA*, Scop.
(*nigra*, F.)
2. Size smaller; elytra with the interstices finely rugose, black or purplish-black in male, coppery in female *D. AFFINIS*, Kunze.

D. crassipes, F. (*spinosa*, Thoms.). Rather depressed, violaceous or greenish-bronze, sometimes bronze with the elytra greenish at margins, thorax usually coppery, under-side with thickly shining silvery pubescence; head finely and thickly punctured with the frontal furrows deep; thorax broader than long, finely strigose, with a strong central furrow, and with the callosity near the anterior angles well marked; elytra with deeply punctured striæ, apex truncate; legs long, reddish with the upper side of the apical portion of the femora, and the external portion of the tibiæ, metallic. L. 9–11 mm.

Male with the fifth ventral segment of the abdomen truncate at apex, the posterior femora stout and strongly bidentate, and the posterior tibiæ crenate dentate on their inner side.

Female with the fifth ventral segment of the abdomen acuminate and deflexed at apex, and the posterior femora armed with a sharp, but less strong, tooth.

On the leaves of the water lily (*Nymphaea alba*) and other aquatic plants; not common, although found in some numbers where it occurs; Kew, Weybridge, Deal, Brentford, Tottenham, Tonbridge; New Forest; Burton-on-Trent; Mabblerley, Cheshire; Windermere; Northumberland district, Prestwich Carr; Scotland, local and rare, Clyde and Argyle districts; Highland lochs (Harker); Ireland, near Dublin; the species is very widely distributed, and probably occurs in many other localities.

D. dentata, Hoppe. Allied to the preceding, but smaller and narrower, and more convex, and easily distinguished by the form and sculpture of the thorax, which is as long as broad, and rather coarsely punctured on disc; colour æneous or coppery with a greenish reflection, under-side silvery; head with deep frontal furrows, antennæ long; elytra deeply punctate-striate, interstices diffusely strigose, apex truncate or feebly emarginate; legs ferruginous with the external portions more or less æneous. L. 7–9 mm.

Male with the first ventral segment of the abdomen longitudinally depressed in middle, and armed with two small tubercles, the posterior femora armed with two sharp teeth, and the posterior tibiæ crenate dentate below middle.

Female with the first ventral segment of abdomen evenly convex, and the posterior femora armed with one rather sharp tooth, and one small tooth, which is sometimes obsolete.

On aquatic plants; rare; Chobham; Sheerness; Shipley, near Horsham; Knepp Pond; Arundel; Tewkesbury; Knowle, near Birmingham; Stephens gives as locali-

ties, Epping, Windsor, Hainault, Hertford, Salisbury, and Cumberland. Ireland, Armagh (Johnson).

D. versicolorea, Brahm. (*bidens*, Ol.; *cincta*, Germ.). Of a shorter and rounder form than the two preceding, and more shining, of a greenish metallic colour at sides, with the disc of thorax and elytra violaceous, or coppery, sometimes dark green, under-side silvery; head thickly and finely punctured; thorax, especially in the male, a little longer than broad, contracted behind middle, strigose and rather strongly and sparingly punctured on disc; elytra deeply punctate-striate, interstices diffusely strigose, apex truncate; legs reddish with the club of the femora and usually external portions of the tibiæ metallic, violaceous. L. 6–9 mm.

Male with the posterior femora armed with two teeth, and the posterior tibiæ crenulate on their inner side.

Female with the posterior femora armed with a small tooth, and the posterior tibiæ very rarely crenulate.

On aquatic plants; not uncommon and widely distributed; Lee, Chobham, Woking, Esher, Wimbledon, Ealing, Rusper, Aylsham; Deal; Hastings; Arundel; New Forest; Sandown; Swansea; Barmouth; Knowle, near Birmingham; Liverpool; Manchester, general on *Potamogeton*; Northumberland and Durham district; Scotland, local, Solway, Tweed, Forth, and Dee districts; Ireland, near Dublin.

D. sparganii, Ahr. In general appearance this species much resembles *D. dentata*, but may easily be distinguished by the shorter femora and the sculpture of the thorax, which is finely strigose and not punctured on disc; the legs are unicolorous, dark, and more or less metallic, whereas in *D. dentata* they are more or less red, and the antennæ also, which in the latter species have the basal part of the first joints, at all events in the male, red, are in *D. sparganii* unicolorous; the colour of the upper side is usually dark coppery green; the thorax is quadrate, and dull, and the elytra are not so deeply punctured as in the preceding species, nor are the interstices so plainly strigose. L. 7–9 mm.

Male with the fifth ventral segment of the abdomen impressed at apex, the posterior femora bidentate, and the posterior tibiæ slightly crenulate internally.

Female with the fifth ventral segment of abdomen even, and the posterior femora armed with two teeth, the external one being small.

On aquatic plants; very local, but sometimes not uncommon where it occurs; Wandsworth; banks of Thames; Pegwell Bay, in ditches (Gorham); Sandwich; Burton-on-Trent; Manchester district, Clifton, Charlton, Stretford, &c.

D. dentipes, F. (*aquatica*, L., Thoms.). A very conspicuous species, which may easily be recognized by the broad purple red stripe which runs down the elytra near suture, the suture and margins as well as the head and thorax being golden green; the antennæ and legs are unicolorous, the latter being mostly of a golden metallic colour and

thickly pubescent, and the under-side is densely clothed with bright golden pubescence; head thickly sculptured with a short and deep central furrow, antennæ with the basal joints pubescent; thorax a little longer than broad, strongly punctured on disc, and rugose at sides, with distinct central furrow; elytra with shoulders strongly marked, much narrowed from posterior third, truncate at apex, with a strong impression just before middle near suture, and moderately strong rows of punctures which are confused at base and finer at apex, interstices finely rugose; posterior femora long, reaching apex of elytra. L. 6–8 mm.

Male with the last ventral segment of abdomen truncate and broadly impressed before apex, posterior femora with one sharp tooth.

Female with the last ventral segment of abdomen rounded at apex and even, posterior femora with a smaller tooth.

On aquatic plants; local; London district, rare, Battersea (Stephens); Aylsham (T. Wood); Hastings; Eastbourne; Arundel; Salisbury; Devon; Cambridge; Redgrave Fen; Potter Heigham, Norfolk; Bewdley; Repton; Scarborough; Hale Moss, and near Bowdon, Manchester district; Mabblerley, Cheshire; Northumberland district, Meldon Park; Scotland, scarce, Solway, Tweed, Clyde, and Forth districts; Ireland, Armagh.

D. limbata, Panz. (*lemnæ*, F.). Rather depressed, female broader and more parallel-sided than male, æneous, often greenish, each elytron with a reddish or purple band reaching along the margin, and a patch at base near suture; this patch is sometimes absent, and occasionally the elytra are unicolorous; the under-side is thickly clothed with ashy silvery pubescence; head closely sculptured with a well-marked central furrow, antennæ black with the first five joints metallic; thorax quadrate, feebly narrowed behind, with the anterior callosity obsolete, coarsely punctured on disc and more or less strigose; elytra distinctly impressed, with comparatively fine rows of punctures, which become almost obsolete at apex, interstices finely strigose, apex truncate; legs unicolorous, metallic. L. 8–11 mm.

Male with the elytra more pointed at apex, the last ventral segment of the abdomen truncate and impressed at apex, and the posterior femora armed with a small blunt tooth.

Female with the elytra broader and less pointed at apex, the fifth segment of the abdomen somewhat produced at apex, and the posterior femora armed with a smaller tooth, which is sometimes almost obsolete.

On aquatic plants; local, but not uncommon in many districts; Lee, Aylsham, Belvedere, Maidstone; Birchington; Pegwell Bay; Deal; Hastings; New Forest; Southsea; Glanvilles Wootton; Devon; Gloucester; Swansea; Bewdley; Cannock Chase; Repton; Ely; Cambridge Fens; Askham Bog, York; Bowdon, near Manchester; Manchester district, general on *Sparganium* (Chappell); not recorded from the Northumberland district; it is said to have been taken in the Forth district of Scotland, but Dr. Sharp says that he has not seen an individual taken in this country. Ireland, near Dublin, and Armagh.

D. bicolora, Zsch. (*sagittariae*, F.; *aquatica*, Schrank.). Allied to the preceding, from which it may be distinguished by its colour,

which is unicolorous golden green, with the under-side clothed with thick yellowish, almost golden, pubescence; occasionally the elytra are a little coppery on the middle of their surface; from unicolorous specimens of *D. lemnae*, which rarely occur, it may be known by the more numerous impressions on the elytra, and the more closely and less strongly punctured thorax; the antennæ are dark with the base metallic, and the legs are unicolorous, and coloured as elytra; the punctures on the elytra are comparatively fine, and become almost obsolete towards apex, and the interstices are finely rugose, and are rather thickly set with large punctures at base. L. $8\frac{1}{2}$ –10 mm.

Male with the elytra narrower and more pointed behind, the fifth ventral segment of abdomen subtruncate and rather broadly impressed at apex, and the posterior femora armed with a strong sharp tooth.

Female with the elytra broader and less pointed behind, the fifth ventral segment of the abdomen somewhat produced at apex, and the posterior femora armed with a distinct but smaller tooth.

On aquatic plants; rather local, but not uncommon in many districts; Mickleham, Lee, Maidstone, Bearsted (Kent); Deal; Hastings; New Forest; Sandown; Glanvilles Wootton; Bath; Swansea; Droitwich; Evesham; Knowle; Cannock Chase; near Burnt Wood, Staffordshire; Cheshire; Liverpool; Manchester district; Northumberland district, rare; Scotland, recorded from the Clyde and Forth districts; but Dr. Sharp says that no Scotch specimen has come under his notice. Ireland, Killarney, Portmarnock, Lough Neagh, &c.

D. obscura, Gyll. Of an obscure brownish-bronze colour, rather dull, under-side thickly clothed with yellowish-golden or ashy-golden pubescence; head very finely sculptured, with a deep frontal furrow, antennæ rather stout, black, with base metallic, third joint nearly twice as long as second; thorax quadrate, with sides almost straight, thickly and strongly punctured on disc, rugose at sides, central furrow often almost obsolete, but sometimes distinct, anterior angles forming a distinct tooth; elytra with comparatively fine rows of punctures, which are finer, but distinct at apex, interstices finely rugose, rather thickly furnished at base with large punctures, apex narrowly truncate; the impressions near suture are distinct, but at sides there is, as a rule, only one longitudinal impression, which is sometimes more or less obsolete; legs dark metallic, posterior femora with a strong tooth in both sexes. L. $8\frac{1}{2}$ –10 mm.

Male with the last ventral segment truncate and impressed at apex, female with the last segment rounded.

On flowering *Scirpus* and *Carex* in May; rare; Arundel (S. Stevens); Mabblerley, Cheshire, near Castle Mill (Chappell); Scotland, Solway district, Dumfries (Sharp and Lennon); also recorded doubtfully from the Tay district.

D. thalassina, Germ. Elongate, subparallel, rather depressed, of a golden green or coppery colour, sometimes reddish or cyaneous, under-side thickly clothed with golden, sometimes ashy, pubescence;

head thickly and rugosely punctured; antennæ black, with base metallic; thorax somewhat longer than broad, closely and deeply punctured, with the lateral callosity moderately distinct, and the anterior angles obtusely dentate; elytra subparallel until behind middle, feebly impressed near suture, rather strongly punctate-striate, interstices finely rugose, reticulate, apex truncate; legs unicolorous, metallic, femora with a sharp tooth in both sexes. L. 7-9 mm.

Male with the fifth ventral segment subtruncate, and impressed at apex, female with the same segment produced and subacuminate.

On *Scirpus*, *Carex*, &c., in June; not common; Caterham, Woking, Bearsted; Faygate, Sussex; Pegwell Bay; Deal; Hastings; Portsmouth district; Bristol.

D. impressa, Payk. (♀ *brevicornis*, Kunze, *nec* Ahr.). Closely allied to the preceding, but shorter, broader, and more shining, with the antennæ shorter, and the posterior femora armed with a blunt and more or less obsolete tooth; the thorax is less closely and less deeply punctured, and has the lateral callosity less distinct, and the impressions on the elytra are more pronounced; in the colour both of the under and upper side it much resembles *D. thalassina*. L. $6\frac{1}{2}$ -9 mm.

On aquatic plants (*Carex*, &c.), in May; not common; Maidstone; Faygate, Sussex (Gorham); Sandwich (T. Wood); Hastings district; Bristol; Bretby Park, Repton (W. Garneys); Scotland, "Ayrshire, Mr. Hardy," Murray's Cat.; this latter record is somewhat doubtful.

D. simplex, F., *Syst. Ent.* (*linearis*, Hoppe; *æruginosa*, Westh.). Elongate, depressed, coppery, reddish, or æneous green, under-side silvery, antennæ and legs partly reddish; head very closely sculptured, thorax slightly longer than broad, very closely and rugosely punctured, with the central furrow more or less obsolete, anterior angles pronounced; elytra long, gradually narrowed to apex in male, more parallel in female, obsoletely impressed, broadly truncate at apex, with rows of rather shallow punctures, interstices closely rugose, giving the insect a frosted appearance; posterior femora simple in both sexes. L. 7-9 mm.

On aquatic plants; generally distributed throughout the kingdom; it is one of the commonest British species.

D. vulgaris, Zsch. (*typhæ*, Ahr.). Allied to the preceding, but, as a rule, easily distinguished by the broad reddish-purple and blue stripe which runs down each elytron near suture; occasionally unicolorous specimens occur, but these may be known by the shorter antennæ, much less pronounced anterior angles of thorax, and more regular striæ of the elytra, which are more parallel and less gradually narrowed behind; the pubescence of the under-side is a little darker and greyer; the very close sculpture of the thorax and the absence of teeth on the posterior femora in both sexes will distinguish it from *D. thalassina*. L. 6-9 mm.

On aquatic plants, *Typha*, *Sparganium*, *Carex*, &c., in June and July; local, and, as a rule, not common; Lewisham, Wandsworth, Surrey Canal, Croydon, Tilgate; Pegwell Bay; Deal; Sandwich; Hastings; Faygate, Sussex; Droitwich; Cheshire; Manchester; Northumberland and Durham district; Scotland, very rare, Clyde and Forth districts; Ireland, Armagh.

D. clavipes, F. (*menyanthidis*, Gyll.; *mutica*, Thoms.). A large and very distinct species, which may be easily known by the shape and sculpture of the thorax, which has the anterior angles rounded, and is gradually narrowed from just behind front margin to base, and has the upper surface very shining, transversely strigose with the disc often almost smooth; the general form is elongate, moderately convex, gradually narrowed behind in male, which is smaller than female; the colour of the upper surface is bright golden green, rarely coppery, and the antennæ and legs are ferruginous, the latter being partly metallic; the under-side is silvery; the elytra are deeply crenate-striate, with the interstices rugose, and the apices are separately rounded; the femora are simple in both sexes. L. 7-12 mm.

Male with the fifth ventral segment subtruncate at apex, female with the same segment somewhat produced.

On aquatic plants, in May and June; local; Surrey Canal, Woking, and other places in the London district; Potter Heigham, Norfolk; Whitstable; Hastings; Arundel; Portsmouth district; Swansea; Barmouth; Whittlesea Mere; Burton-on-Trent; Manchester district (on *Arundo phragmites*); Scotland, rare, Solway and Forth districts; it probably occurs in many other localities, as it is widely distributed.

D. semicuprea, Panz. (*simplex*, F., *Syst. El.*; *iris*, Westh.). A rather short species and comparatively broad and convex, of a greenish-coppery or golden-green colour, occasionally green with a purplish band on each elytron, and rarely nigro-æneous, under-side silvery; male much narrower than female; head finely and thickly punctured, antennæ dark brown or blackish, with the base of the first joint sometimes lighter; thorax longer than broad, gradually narrowed behind, thickly and strongly punctured, with the central furrow variable, sometimes broad and deep, at other times obsolete; elytra widest about middle, obsoletely impressed, crenate-striate, with the interstices rugose, obtusely truncate at apex, but with the external angles rounded; legs rather long, metallic, with the base of femora and the tibiæ towards apex pitchy red; posterior femora simple in both sexes. L. 5-9 mm.

Male with the first ventral segment of abdomen broadly impressed longitudinally in the middle, and the fifth subtruncate at apex; female with the first ventral segment even, and the fifth somewhat produced at apex.

On aquatic plants in May and June; local; London district, not uncommon and widely distributed; Hastings; Sandwich; Pulborough, Sussex; Dover; Devon; Bristol; Swansea; Knowle; Rainham, Norfolk; Hertford; Essex; Oxford (R. Isis); Lincoln; Selby, York; Scotland, rare, Forth district, "Braid Ponds, Loch Leven," Murray's Cat. Ireland, Armagh.

D. cinerea, *Herbst.* (*hydrochæridis*, F.). This species may be distinguished from all the rest of the British *Donaciæ* by having the upper surface thickly clothed with greyish-silvery pubescence, so that the insect presents a dull and mealy appearance; the only other European species that resembles it in this respect is *D. tomentosa*; the under-side is silvery; it is elongate, sublinear and depressed, of a greenish or reddish coppery colour, with the antennæ dark, the base of the joints being more or less ferruginous, and the legs metallic, partially ferruginous; head and thorax very closely sculptured, the latter subquadrate with the anterior angles scarcely prominent; elytra subparallel, widest about middle, with the apices rounded or very obtusely truncate, feebly impressed on disc near suture, with comparatively finely punctured striæ, interstices closely rugose; posterior femora simple in both sexes. L. 7–10 mm.

Male with the last ventral segment subtruncate at apex and impressed, female with the same segment rounded at apex.

On aquatic plants, *Sparganium*, *Typha latifolia*, *Arundo phragmites*, &c., in May and June; rare; Woolwich; Surrey Canal; Woking (banks of Basingstoke Canal); Faygate, Sussex; Winchelsea; Deal; Swansea; Bristol; Yorkshire; Northumberland district, Prestwick Carr (Wailes).

D. sericea, L. (*lævicollis*, Thoms.; *proteus*, Steph.). Convex, rather short, broader in male than in female, upper surface shining, rarely dull, strongly metallic, very variable in colour, presenting all shades of coppery, greenish-coppery, æneous, green, blue, blue-black, crimson, &c.; the base of the antennæ and the legs are concolorous with the upper side; under-side silvery; head thickly punctured, with the frontal furrow deep, antennæ rather long, with the third joint elongate, twice as long as second; thorax longer than broad, narrowed behind, very closely sculptured, with the anterior angles acute and reflexed and the lateral callosities strongly defined; elytra broadest at shoulders, distinctly impressed, with moderately strongly punctured striæ, the punctures being connected by transverse wrinkles, and the interstices besides these being more or less distinctly rugose, apices rounded or obtusely truncate; legs moderately long, femora with a strong triangular tooth in both sexes. L. 7–9½ mm.

Male with the first ventral segment of abdomen broadly impressed at apex, and the fifth impressed and truncate at apex, female with the fifth segment rounded at apex.

On aquatic plants; common and generally distributed from the northern midland counties southwards; less common further north; Scotland, not common, Solway, Tweed, Forth, Dee, and Moray districts; Ireland, near Dublin and Armagh, and probably widely distributed.

D. discolor, Panz. (*comari*, Suffr.; *proteus*, Kunze; *geniculata*, Thoms.). Very closely allied to the preceding in shape, colour, and general structure and sculpture; it may, however, be easily known by

having the antennæ comparatively short and stout, with the third joint less elongate and only a little longer than the second, and especially by the fact that the anterior angles of the thorax are rounded and deflexed, and the lateral callosities are much less marked and are confounded anteriorly with the margin; the antennæ and legs are sometimes partially ferruginous. L. $6\frac{1}{2}$ –9 mm.

On aquatic plants; it was first recognized as taken in Perthshire by Mr. James Foxcroft in May, 1854, but has since been found in several localities in England; it appears to prefer rather high boggy districts; local; London district not uncommon, Lewisham, Wimbledon, Woking, Esher, Chobham; Deal; Sutton Park; Cannock Chase; Manchester district, rare; Northumberland and Durham district, not uncommon, especially in mossy holes on the moors; Scotland, common in bogs on the moors, Solway, Tay, Dee, Moray, and probably other districts.

D. braccata, Scop. (*nigra*, F.). A large and conspicuous species, elongate, subparallel, rather convex, black, with a more or less distinct purple reflection, thorax greenish, under-side thickly clothed with greyish or golden-yellowish pubescence, antennæ, legs, and last four segments of abdomen red, scarcely pubescent; head finely and thickly punctured, with the central furrow long and deep, antennæ long; thorax subcordate, strongly narrowed behind, impressed at base, not strongly punctured, with central furrow often obsolete, anterior angles small and blunt; elytra parallel-sided, separately rounded at apex, with rather strong punctured striæ, interstices coarsely rugose; posterior femora with a strong tooth in male, and a feeble or almost obsolete tooth in female. L. 9–11 mm.

Male with the metasternum and first ventral segment of abdomen broadly impressed and the fifth segment slightly emarginate at apex, thorax sparingly punctured and smooth in the middle.

Female with the fifth ventral segment subtruncate at apex, and the disc of thorax rather closely punctured.

On aquatic plants, *Phragmites*, &c., in June; local, and as a rule rare, but occasionally found in abundance, especially near the coast; Battersea (Stephens), Greenwich, Woolwich, Gravesend, Southend, Whitstable; Bearsted; Pegwell Bay; Deal; Hastings; Swansea; Cambridge; Whittlesea Mere.

D. affinis, Kunze. Oblong, subparallel, rather convex, upper side metallic, especially in female, under-side silvery, except the last four segments of the abdomen, which, together with the antennæ and legs, are red; head closely punctured, with deep central furrow, antennæ comparatively short; thorax subquadrate, gradually and slightly narrowed behind, rather finely punctured, with the anterior angles slightly prominent and callose; legs short. L. 5–8 mm.

Male with the upper side black with a purple reflection, or violaceous, the thorax sparingly punctured, the metasternum and first ventral segment broadly impressed, and the last segment slightly emarginate, the posterior femora thickened and armed with a strong sharp tooth, and the elytra punctate-striate, with the interstices finely coriaceous.

Female with the upper side æneous or coppery, and more shiny, the thorax closely punctured, the fifth ventral segment broadly truncate at apex, the posterior femora more slender and armed with a small tooth, and the elytra punctate-striate with the interstices distinctly strigose.

On aquatic plants, *Carex*, &c., May and June; local and not common; Horsell (Surrey). Battersea, Greenwich, Maidstone; Birchington; Dover; Winchester; Devon; Bristol; Swansea; Knowle, near Birmingham; Cambridge.

HÆMONIA, Curtis. (*Macroplëa*, Hoff.)

This genus contains at present about thirteen species, of which five are found in Europe, and the remainder have been described from North America and Mexico; three or four of the recently described species appear to be now considered as merely synonyms of former species; they much resemble *Donacia* in shape, but may be easily known by their non-metallic upper surface, and the strong spine at the external apical angle of elytra; the tarsi are very long, the first three joints not being pilose beneath, and the onychium being as long or longer than the preceding joints and terminated by very strong claws.

The larva of *Hæmonia Curtisi* differs from that of *Donacia* in having no ocelli or labial palpi, and the antennæ consisting only of two joints, and more particularly in the fact that one of the stigmata is situated on the under-side of the prothorax.

- I. Spine at apex of elytra shorter; average size smaller; posterior femora scarcely clavate at apex . H. CURTISI, Lac.
- II. Spine at apex of elytra longer; average size larger; posterior femora distinctly clavate at apex . H. APPENDICULATA, Panz. (*equiseti*, F.)

H. Curtisi, Lac. (*Gyllenhali*, Lac.; *zosteræ*, var. *Curtisi*, Weise). Head black, thorax testaceous with two black lines or spots on each, elytra testaceous with black punctured lines, under-side black clothed with yellowish-silvery pubescence, which is sometimes golden, legs clear testaceous with the tarsal joints more or less fuscous; head closely punctured, impressed, antennæ long, dark with base lighter, pubescent, inserted near one another; thorax about as long as broad, very finely sculptured, with the anterior angles slightly prominent, and the sides rather strongly contracted a little behind these, disc with two black lines or patches, elytra much broader than thorax, gradually contracted towards apex, with the external angle produced into a sharp spine, and the internal angle obtuse, almost rounded, or produced in a small tooth; the striæ are black with black, moderately strong, punctures; legs long, yellow, tarsi more or less fuscous. L. $4\frac{1}{2}$ –6 mm.

Male with the first ventral segment of the abdomen longitudinally impressed, female with the first ventral segment even, and the posterior tibiæ bisinuate internally.

On *Potamogeton pectinatus* and *Zostera marina*, in brackish water near the coast;

local, but abundant where it occurs; London district, Gravesend, Sheerness; Aldeburgh, Suffolk; Birchington, near Margate; Hull; Hartlepool, abundant; the old records from Cambridge and Windsor probably refer to the succeeding species.

According to several authors, *H. Curtisi* is merely a variety of *H. zosteræ*, which is the name given to the British species by Stephens, but of which the type form does not appear to have been recognized as found in Britain; it seems, however, to differ only in having the punctures of the striæ of the elytra and not the striæ themselves black, and in having the black thoracic lines more pronounced; Weise describes *H. zosteræ* as "*thorace nigro-bilineato*," and *H. Curtisi* as "*thorace bimaculato*," but specimens of the latter insect have the markings on thorax evidently consisting of two lines. Stephens mentions the inner apical angle of the elytra as being rounded in this species and produced into a slight spine in the following, but it is certainly sometimes produced in *H. Curtisi*; there is, however, considerable confusion still existing between the species; Thomson, for instance, gives *H. zosteræ*, *H. Curtisi*, and *H. Gyllenhali* as distinct species, whereas by Weise they are all regarded as one species.

H. appendiculata, Panz. (*equiseti*, F.). Closely allied to the preceding, but with the spine at the apex of the elytra longer and the striæ deeper, more deeply punctured, and blacker; the femora are more distinctly clavate, and the apex of the femora and tibiæ, as well as the apex of the joints of the tarsi, is black; the lateral callosity before the anterior angles of the thorax is less distinct, and the thorax itself is a little longer; the general size is larger; the species may be further known by its habitat, as it is found inland, whereas *H. Curtisi* appears to be confined to the neighbourhood of the coast. L. $5\frac{1}{2}$ – $8\frac{1}{2}$ mm.

On aquatic plants; extremely rare; two specimens are recorded by Stephens as taken near Windsor; the only British specimen that I have seen is one that was taken by the Rev. C. F. Thornevill in flood rubbish near Burton-on-Trent, and given by him to me soon after I began collecting; it is now in the collection of Mr. P. B. Mason, of Burton-on-Trent. According to Weise this species occurs on *Potamogeton lucens* and *pectinatus* and *Myriophyllum spicatum* in May and June.

CRIOCERINA.

This tribe contains a few genera and a very large number of species, which may be known by having the antennæ distant at base and the first segment of the abdomen short; the antennæ are comparatively short and stout, and the eyes are prominent and more or less emarginate; the thorax is plainly narrower than the elytra, which are usually oblong and subparallel, and have the shoulders well marked; the first ventral segment, as a rule, is scarcely longer than second, but is somewhat longer in *Zeugophora* than in our other genera; the last-mentioned genus is in some respects intermediate, and is classed by Thomson with the Orsodacnidæ or Sagrina.

- I. Tarsal claws toothed; eyes feebly emarginate ZEUGOPHORA, Kunze.
- II. Tarsal claws simple; eyes evidently emarginate.
 - i. Tarsal claws connate at base, scutellum plainly truncate at apex LEMA, F.
 - ii. Tarsal claws not connate; scutellum not, or scarcely, truncate at apex CRIOCERIS, Geoff.

ZEUGOPHORA, Kunze.

This genus contains about twenty species, of which four are found in Europe, and the remainder have been described from North America, the Amur district, Assam, and Ceylon; they are characterized by having the upper surface sparingly pubescent, the eyes slightly emarginate, and the thorax furnished at sides with a strong, sharp tubercle; the last joint of the tarsi is short, and the tarsal claws are armed with a blunt tooth; the thorax is much narrower than the elytra, which are oblong, subparallel, and very strongly punctured.

- I. Elytra dark.
 - i. Head entirely reddish-yellow Z. SUBSPINOSA, F.
 - ii. Forehead and vertex of head black Z. FLAVICOLLIS, Marsh.
- II. Upper surface entirely testaceous Z. TURNERI, Power.

Z. subspinosa, F. Black, with the first four joints of the antennæ, the head, thorax, and legs red; head rather strongly punctured, eyes prominent, antennæ short; thorax strongly punctured, with a large blunt lateral tubercle on each side, much narrower at base than elytra; elytra subparallel, strongly margined, very coarsely punctured; legs moderately stout; the mesosternum is sometimes red. L. 3 mm.

On young aspens, in woods, rather local, but not uncommon; London district, generally distributed; Whitstable; Hastings; Hampshire; Bewdley Forest; Knowle; Wicken Fen; Weston, Oxfordshire; Bretby, near Repton; Chat Moss; Langworth Wood, Lincoln; Manchester and Liverpool districts; it has not been recorded from the extreme northern counties of England, or from Scotland.

Z. flavicollis, Marsh. Very like the preceding, from which it may be at once known by the colour of the head, which has the part before the eyes yellow and the remainder black; the lateral tubercles of the thorax are larger and spiniform, and the posterior femora are fuscous; the elytra also are more sparingly punctured. L. $2\frac{1}{2}$ – $3\frac{1}{2}$ mm.

In woods; very rare; Bexley and Ashford (Kent); Kimpton, Hants; Seal Wood, Leicestershire (J. T. Harris); Manchester district; one specimen from H. Adams, Kendal (Power).

Z. Turneri, Power (*rufo-testacea*, Kr.). Rather more elongate than either of the preceding species, and easily distinguished by its colour, which is entirely rufo-testaceous, with the eyes, mesosternum, metasternum, and abdomen black; in general form it much resembles *Z. subspinosa*, but the head is more closely and deeply punctured, and not so much contracted behind the eyes, which are less prominent, and the thorax is

broader and has the lateral tubercles more prominent and continued with a slight curve until they meet the anterior margin; the elytra are thickly and strongly punctured, and the separate side margin is furnished with a row of fine and often obsolete punctures. L. $3\frac{1}{2}$ mm.

On young birches and aspens; very local; Tay, Dee, and Moray districts; it was first discovered by Charles Turner at Rannoch, and was named after him by Dr. Power; the name was afterwards sunk in favour of *rufo-testacea*, Kraatz, by certain European authorities, but in the catalogue of Heyden, Reitter, and Weise it is reinstated; it is sometimes abundant where it occurs; I have a note from the Rev. C. T. Cruttwell, in which he records it as found by himself "in the utmost profusion on young aspens at Pitlochry, end of August, 1884."

LEMA, Fabricius.

This is one of the largest genera of the Coleoptera in point of numbers; more than five hundred species have already been described, about ninety of which have been added since the publication of the Munich catalogue; they are chiefly found in tropical countries, and are very widely distributed; only eight occur in Europe, of which four inhabit Britain; they are closely allied to *Crioceris*, from which they differ in having the tarsal claws connate, and the head contracted behind into a shorter neck; the eyes are emarginate; the scutellum is truncate at apex; the elytra are oblong, variable in breadth, and as a rule much broader than thorax.

I. Upper surface entirely blue or greenish-blue.

i. Thorax constricted just behind middle L. CYANELLA, L.
(*puncticollis*, Curt.)

ii. Thorax constricted just before base.

1. Size smaller; elytra shorter in proportion to thorax,
which is more strongly constricted behind L. LICHENIS, Voet.
(*cyanella*, Suffr.)

2. Size larger; elytra longer in proportion to thorax,
which is very slightly constricted behind L. ERICHSONI, Suffr.

II. Thorax bright red L. MELANOPA, L.

L. cyanella, L. (*puncticollis*, Curt.). Rather broader and more convex than either of the three following species, of a deep blue colour, shining, antennæ and legs dark; head much contracted behind eyes, which are large and very prominent; thorax about as long as its greatest breadth, strongly constricted behind middle, rather strongly and not closely punctured, with a smooth and somewhat raised central line; elytra much broader than thorax, with rather fine rows of punctures, interstices very finely cross-striated; the colour is variable, being occasionally violet or blackish. L. 4- $5\frac{1}{2}$ mm.

Male with the anterior tarsi slightly dilated.

By sweeping herbage in meadows; as a rule found on species of thistles, especially *Cirsium arvense*; local; London district, not uncommon and generally distributed; Hastings; Eastbourne; Portsmouth district; Glanvilles Wootton; Swansea; Llangollen; Barmouth; Wicken Fen; Oxfordshire; Knowle, near Birmingham; Scotland rare, in ants' nests, Tweed district (Sharp); Ireland, near Belfast.

L. lichenis, Voet. (*cyanella*, Suffr., nec L.). Smaller than the preceding species, and with the elytra narrower in proportion and much more coarsely punctured; the shoulders also are less marked; as a rule the colour is less deep blue and somewhat greenish, but in this point both the species are variable; the thorax is constricted just before base, the constriction being striate at the sides; the upper surface is sparingly punctured behind the anterior angles, and has two parallel rows of punctures in the middle; the elytra are punctured in very coarse rows, the interstices being furnished with very small punctures; the upper surface is occasionally violaceous or black. L. 3-4 mm.

By sweeping herbage in damp places; on willows, &c.; often found at roots of grass and in moss; generally distributed and common throughout the kingdom.

L. Erichsoni, Suffr. Elongate, with the elytra much longer in proportion to thorax than in the preceding species, which it resembles in colour, and with which it has been compared by many authors; it is, however, far more closely allied to *L. melanopa*, of which it might almost be regarded as a concolorous form; the thorax is scarcely constricted at base, and its disc is exceedingly finely punctate, with three irregular longitudinal rows of larger punctures on each side; the elytra are more finely punctured than in *L. cyanella*, and have the interstices transversely wrinkled. L. 4-4½ mm.

Very rare; Ireland, near Waterford (Power), 1857; one specimen also exists in Mr. Stephens' collection, where it is set apart as separate, but not labelled. Mr. Crotch (Ent. Ann. 1867, 124) is of opinion that our British specimens must be referred to an unnamed concolorous variety of *L. melanopa*, and that we do not possess the true *L. Erichsoni*, Suffr.

L. melanopa, L. Elongate, of a greenish-blue or cyaneous colour, with the thorax and legs red, and the antennæ, apex of tibiæ, and tarsi black; eyes prominent; thorax convex, with two or three rows of punctures on each side, slightly constricted before base; elytra long, with rather strong punctured striæ; legs rather long. L. 4-4½ mm.

By sweeping herbage; generally distributed and common throughout England and Wales; Scotland, common in the south; Ireland, near Dublin, &c., and probably widely distributed.

CRIOCERIS, Geoffroy.

This genus contains about a hundred species, which are distributed over the greater part of the world, but are found more abundantly in tropical than in temperate climates; twelve species are found in Europe; they are somewhat variable in form, but have the thorax much narrower than the elytra, which are oblong or elongate and subparallel or slightly rounded at sides; the eyes are emarginate; the head behind the eyes is constricted into a more or less distinct neck; the legs are moderately long, and the tarsal claws are simple and not connate.

The larva of *C. merdigera* is described and figured by Westwood (quoting from Reaumur) in the Modern Classification of Insects, i. p. 372-4, fig. 45, 12 and 13;

he also gives an account of the life-history of the insect, which is as follows:—"The eggs (eight or ten in number) are deposited upon the leaves of the white and other lilies, fastened near together by a glutinous secretion, which soon hardens. The larvæ are hatched in about fifteen days; at first they feed gregariously upon the parenchyma of the leaf, progressing in regular rows, but separating as they increase in growth; they are short, thick, and fleshy, with six articulated legs, and the skin of a dirty colour; as a rule they are entirely covered with a layer of humid matter, resembling macerated leaves, but which is composed of the excrement of the insect, the anal aperture being placed in the dorsal part of the last segment of the body, thus affording a singular, but apparently disgusting, means of defence against the effects of the sun, or the rapacity of insectivorous birds; the excrement being by degrees pushed forwards and upwards, without adhering to the body of the larva, which is, indeed, able to cast it entirely off at will. The larva attains its full size in about a fortnight, when it descends into the earth, and forms an oval cell, smoothly polished, and coated on the inside with a varnish-like secretion, within which it assumes the pupa state, which lasts about another fortnight."

The larvæ of *C. asparagi* are short, thick and fleshy, and are narrowed in front; they are of a dirty slate-colour, with the head and legs and two oblong spots on the first segment black; they possess a fleshy proleg at the apex of the abdomen, by which they adhere so closely to their food-plant that it is hard to pull them off; when alarmed they emit from their mouth a black fluid; these larvæ occasionally do considerable damage to asparagus crops; Miss Ormerod (Manual of Injurious Insects, p. 2) suggests several remedies; dipping the infested shoots in a mixture of half a pound of soft soap, a quarter of a pound of flowers of sulphur, and about the same quantity of soot, well mixed together in a pail of water, has been found a good remedy; syringing with water warm enough to make the grubs loosen hold, but yet not of a heat to hurt the foliage, will clear them; the greater part fall as the water touches them, and the rest on a smart tap being given to the shoot; the ground underneath may be strewed with soot, which prevents their return.

Of our three British species one is somewhat doubtfully indigenous, and has not been taken for many years, and another is extremely rare.

- I. Thorax very strongly constricted about middle, almost cordiform; elytra entirely red *C. LILII*, Scop.
(*merdigera*, F.)
- II. Thorax slightly contracted before base, cylindrical.
 - i. Elytra red, with six small black spots on each *C. DUODECIM-PUNCTATA*, L.
 - ii. Elytra of a deep cœruleous or greenish-cœruleous colour with the sides, apex, and three large spots at sides of each (sometimes more or less confluent) testaceous *C. ASPARAGI*, L.

C. lilii, Scop. (*merdigera*, F., *nec* L.; *liliorum*, Thoms.). Oblong, rather convex, with the elytra much broader than thorax, of a bright scarlet colour, with the head, antennæ, legs, and under-side black; the scarlet colour fades considerably after death; head broad, strongly furrowed; antennæ rather long, thickened towards apex; thorax strongly constricted behind middle and depressed before base, uneven, sparingly punctured, with a tolerably regular row of punctures on the central line; elytra with comparatively fine punctured striæ, interstices smooth. L. 6–8 mm.

On species of *Lilium*, chiefly on the large white garden lily; very rare; Deptford, Camberwell, Peckham, and one or two other London localities; Swansea district;

the *C. merdigera* of Linné is a different insect, and may be distinguished by having the apex of the abdomen and part of the legs scarlet; it appears to be found chiefly on *Convallaria majalis* (Lily of the Valley), but has also been taken on *Allium cepa* and *Lilium martagon*.

C. duodecim-punctata, L. Rather shorter and with the elytra much narrower than in the preceding species, red, with the antennæ, scutellum, breast, base of abdomen, knees, apex of tibiæ, tarsi, and six small spots on each elytron black; thorax almost parallel-sided or with the sides only a little rounded, slightly contracted before base, exceedingly finely punctured; elytra with moderately strongly punctured striæ; the colour is somewhat variable. L. 5-6½ mm.

On *Asparagus officinalis*; very rare; Bath, and near Bristol (Stephens); it has not occurred for many years, and is somewhat doubtfully indigenous.

C. asparagi, L. Elongate, of a dark greenish or bluish metallic colour, with the thorax red, usually marked with two or three more or less obsolete dark spots, and the elytra with side border, apex and three spots on each (which are variable, and often more or less confluent) testaceous; head large, rugose in front, antennæ dark, rather short and stout; thorax subcylindrical, longer than broad, moderately strongly punctured, scarcely narrowed before base; elytra elongate, parallel-sided, with rows of rather strong punctures, which become feebler at sides and apex; legs black, or black with the base of the tibiæ red. L. 5-6½ mm.

Male with the anterior tibiæ slightly curved.

On *Asparagus officinalis*; local, but common where it occurs; it is generally distributed in the London and Southern districts, and is not uncommon in the Midlands; I do not, however, know of a record from any locality further north than South Derbyshire.

CAMPTOSOMATA.

The members of this group have the body cylindrical or broad and short cylindrical with the thorax transverse and about as broad or as broad as the elytra; the head is not constricted into a neck behind, and the antennæ are serrate or filiform, and are inserted on the anterior margin of the eyes with a considerable interval between them; the thorax is nearly always margined at the sides, and the two last segments of the abdomen are connate; the legs are more or less stout; the group is included by Thomson under the Cyclica, to which it must be allowed it bears a very strong affinity; it may be divided into the two following tribes:—

- I. Anterior coxæ contiguous; antennæ serrate; form longer CLYTHRINA.
- II. Anterior coxæ widely separated; antennæ filiform; form shorter and comparatively broader CRYPTOCEPHALINA.

CLYTHRINA.

This tribe contains about thirty genera and a considerable number of species, of which nine genera, represented by about ninety species, occur

in Europe; apart from the distinguishing characters above mentioned the head is more prominent than in the *Cryptocephalina*, and the pygidium is covered; the forehead in the larva also is convex, and the bag-like covering thin and fragile; the two British genera may be thus distinguished:—

- I. Posterior angles of thorax acute and elevated *LABIDOSTOMIS*, Lac.
 II. Posterior angles of thorax rounded and not elevated *CLYTHRA*, Laich.

LABIDOSTOMIS, Lacordaire.

This genus contains nearly fifty species, which appear to be confined to Europe, North Africa, and Northern and Central Asia; there are twenty-eight European species, of which one is found in Britain; it has been hitherto united with *Clythra* in our catalogues, to which genus it is certainly closely allied, but it differs in having the clypeus bidentate or tridentate, the mandibles, especially of the male, large, and the posterior angles of the thorax acute and elevated; the anterior legs, especially in the male, are longer than the intermediate.

The larvæ resemble that of *Clythra*; that of *C. tridentata* is figured by Westwood (Classification, i. p. 383, fig. 47, 11).

L. tridentata, L. Oblong, convex, subparallel, of a cyaneous or greenish-cyaneous, or metallic green colour with the elytra testaceous, immaculate; head depressed, closely punctured, antennæ rather short, dark-metallic with base reddish; thorax transverse, broadest at base, where it is about as broad as elytra, closely and strongly punctured; scutellum large; elytra thickly and rather strongly punctured, with traces of raised lines; legs moderate, the anterior pair being evidently the longest. L. 6–8½ mm.

Male with the clypeus tridentate, the mandibles slightly exserted, and the thorax transversely impressed before apex.

Female larger and stouter than the male, with the clypeus emarginate, and the fifth ventral segment of abdomen broadly impressed with a round fovea.

On willows, birches, oaks, &c.; sometimes found about ants' nests; rare; Darent Wood (Lewis); Coombe Wood, Worcestershire and Yorkshire (Stephens); Bewdley on willow (Blatch).

CLYTHRA, Laicharting.

The species belonging to this and the following genus are very easily known by their broad oblong and parallel form and short thorax, which is as broad at base as the elytra, and is strongly produced in the middle of base; the clypeus has the anterior angles slightly acute, and the mandibles are very short; the antennæ are serrate from the fourth or fifth joint; the eyes are very large, oblong; the posterior angles of the thorax are rounded; the scutellum is large and triangular; the legs are stout, with the tibiæ thickened towards apex and the tarsi broad, the

third joint of the latter being bifid; the claws are simple; the genus contains forty species, of which eight are found in Europe and the remainder are widely distributed from Siberia to the Cape of Good Hope; only one or two appear to have been found as yet in the New World; there is one British species, and a second has sometimes been included in our lists, but it can hardly be regarded as indigenous. The larvæ of a considerable number of the species of *Clythra* have been described by different authors; they inhabit hairy cases of a leathery-like material, which they drag about with them; the head is protruded from the narrow end; when full fed the insect retires into its case and changes to a curved pupa; the larvæ are rather thick and fleshy, and are curved behind as in the *Lamellicornia*; they much resemble those of *Cryptocephalus*, both in form and in the fact that they inhabit cases.

C. quadripunctata, L. Oblong, convex, subcylindrical, shining, black, with the elytra reddish-testaceous with two black spots on each, one near shoulder, and a larger one behind middle; head depressed, rugose, antennæ short, black, with the second and third joints entirely, and the fourth and fifth partly, red; thorax transverse, strongly narrowed in front, with large margins which are thickly punctured, disc finely punctured; scutellum large; elytra distinctly, but not strongly, punctured, with traces of fine raised lines, sutural angles obtuse; legs stout. L. 7–11 mm.

Male with the last ventral segment furnished in middle with a broad, shining, obsolete impression; female with the same segment furnished with a deep subtriangular impression at apex.

On oaks, birches and hazels, and by sweeping herbage; the larva is sometimes found in nests of *Formica rufa*; local, but not uncommon in some districts; London district, rather common in places, Lee, Peckham, Chatham, Sandhurst, Woking, Epping Forest, Weybridge; Whitstable; Hastings; Portsmouth district; Southampton; New Forest; Whitsand Bay, Plymouth; Fordlands, Devon; Swansea; Llangollen; Burnt Wood, Staffordshire; Bewdley; Trench Woods, Bromsgrove; Hopwas Wood, Tamworth; Northumberland district, Newcastle, &c.; Scotland, rare, Tay, Dee, and Moray districts.

(*C. laeviuscula*, Ratz. This species appears to be very closely allied to the preceding, from which it differs in having the disc of the thorax hardly perceptibly punctured and its margins narrow, and the sutural angles of the elytra rounded; the black patches on the elytra are somewhat differently shaped, that near the shoulders being larger. L. 7–11 mm.

Mr. Crotch introduced the species on the authority of two old specimens without locality which he found mixed with *C. quadripunctata*; the species requires confirmation before it can be regarded as indigenous.

CRYPTOCEPHALINA

This tribe contains about forty genera, of which by far the most important is *Cryptocephalus*, which is the only one that is represented in the British fauna; the only other genera found in Europe are *Pachy-*

brachys and *Stylosomus*; the members of the tribe have the thorax margined at sides, and as broad as the elytra, to which it is closely applied, so that the whole form is robust and compact; the head, as the name implies, is retracted and nearly hidden; the antennæ are inserted a little above the line of the eyes and are widely separated, and, as a rule, long and slender; the anterior coxal cavities are closed behind, and the anterior coxæ are transverse, not prominent, and distant; the pygidium is bare, and the abdomen has the last two segments connate; the legs are moderate, the anterior pair being often more or less elongated; the species, as a rule, are brightly coloured, and very often variegated, although a considerable number are black; they are very rarely pubescent; they occur on the leaves of various trees and shrubs, and are more or less gregarious in their habits; the larvæ have the forehead depressed, and the sac in which they live thicker and much less fragile than in *Clythra*.

CRYPTOCEPHALUS, Geoffroy.

In point of numbers this is one of the largest of all the genera of Coleoptera; no less than six hundred and eighty-one species are enumerated in the catalogue of Gemminger and Von Harold, and about one hundred and fifty more are recorded by Donckier de Donceel in his supplement published in 1885; besides the characters mentioned in the description of the tribe, they may be known by their kidney-shaped eyes, distinct scutellum, bifid third joint of tarsi, simple claws, and the fact that the thorax is sinuate and compressed on each side at base.

The females are, as a rule, larger than the males, and often more strongly punctured, and may be known by the large deep round fovea in the middle of the last abdominal segment, in which the egg is retained before it is attached to the plant; the males often have the last segment more or less depressed or foveate, and furnished with teeth, transverse carinæ, &c.

The larvæ of the *Cryptocephali* (as described by Weise, l. c. p. 139) remain, with their abdomen curved against the breast, in a cylindrical bag, which is narrowed in front, and which they can only get out of as far as the first abdominal segment, and drag along with them in an oblique, almost upright, position, with a jerky motion; they closely resemble the larvæ of *Clythra*, and only differ, in fact, by their flat and depressed head; the pupæ are attached to dry leaves and stems of grass, and the perfect insect appears at the beginning of summer.

Westwood (Classification, vol. i. p. 386) has a note on the larva of *C. 12-punctatus*, and mentions that in the spring of 1827 M. Génè discovered several cased larvæ on the trunk of an oak, which changed on June 15th to this insect; the head of the larva exactly fits the orifice of the case; the antennæ are short, and 3-jointed, the mandibles triangular and bifid at the tip, and the legs are very long and slender; the case, according to M. Génè, is formed of the excrement of the insect, moulded into the proper form by the assistance of its mandibles;

the supposed larva of *C. sericeus* is figured by Westwood (Classification, i. p. 383, fig. 47, 12, 14).

About one hundred and forty species of the genus are found in Europe, of which eighteen, or, as some authors reckon, nineteen, occur in Britain; these may be divided as follows, but the classification must be regarded as purely artificial, and merely as an aid to identification; Weise, in his work, does not attempt to give a detailed classification, but refers the several groups to some well-known species as a type species, and then arranges the allied species near it; as regards the punctuation of the elytra, which is a very useful character, *C. coryli* and *C. lineola* are intermediate between the species with confused and regularly punctured elytra; they are, however, exceedingly distinct species, so that no difficulty can well arise regarding them.

I. Elytra closely and confusedly punctured.

i. Upper surface not metallic; antennæ lighter at base.

1. Thorax and femora entirely black or blue-black

C. PRIMARIUS, Har.
(*imperialis*, F., nec Laich.)

2. Thorax more or less yellow; femora with a yellow spot at apex

C. SEXPUNCTATUS, L.

ii. Upper surface metallic, golden green, coppery, or purplish; antennæ entirely dark.

1. Average size larger; antennæ longer; pygidium not carinate

C. AUREOLUS, Suffr.

2. Average size smaller; antennæ shorter; pygidium feebly carinate

C. HYPOCHÆRIDIS, L.

II. Elytra with rows of punctures, which are more or less irregular or confused.

i. Upper surface metallic, bluish-green or blue

C. OCHROSTOMA, Har.
(*nitidulus*, Gyll.)

ii. Upper surface not metallic.

1. Thorax black in male, red in female, elytra red, or red with black shoulders

C. CORYLI, L.

2. Thorax black; elytra yellow with a broad longitudinal black band on each

C. BIPUNCTATUS, L.
(*v. lineola*, F.)

3. Thorax black; elytra black with the apex rufo-testaceous

C. BIGUTTATUS, Scop.
(*bipustulatus*, F.)

III. Elytra with regular and distinct rows of punctures.

i. Upper surface metallic, the elytra at least being cyaneous.

1. Anterior pairs of legs reddish-yellow

C. PUNCTIGER, Payk.

2. Legs cyaneous, unicolorous with body

C. PARVULUS, Müll.
(*fulcratus*, Germ.)

ii. Upper surface not metallic.

1. Thorax black with yellow markings.

- A. Thorax very diffusely, but comparatively strongly, punctured; size moderate; elytra yellow, with variable black markings, or entirely black

C. DECEMMACULATUS, L.
(*decempunctatus*, L.)

- B. Thorax very finely punctured; size larger; elytra black with the apex and a longitudinal patch at margins yellow C. MORÆI, L.
- C. Thorax closely and distinctly strigose longitudinally; size small; elytra yellow with the suture and a longitudinal stripe on each black C. BILINEATUS, L.
- 2. Thorax yellow; elytra variable, often entirely yellow, but with at least the apex yellow.
 - A. Elytra with punctured striæ continued to apex; prosternum without labial process . . . C. FULVUS, Goeze (minutus, F.)
 - B. Elytra with punctured striæ almost effaced for posterior third; prosternum with a long and sharp labial process C. PUSILLUS, F.
- 3. Thorax and elytra entirely black.
 - A. Thorax smooth; elytra with the punctured striæ, at all events the inner ones, more or less effaced for posterior third.
 - a. Size smaller; anterior femora in part dark C. LABIATUS, L.
 - b. Size larger; anterior legs entirely yellow . . . C. QUERCETI, Suffr.
 - B. Thorax very finely but distinctly strigose; elytra with the punctured striæ almost, if not quite, reaching apex C. EXIGUUS, Schneid. (Wasastjernæ, Gyll.)
- 4. Thorax black, with anterior margin very narrowly yellow, smooth; elytra entirely black, with punctured striæ reaching apex . . C. FRONTALIS, Marsh.

C. primarius, Har. (*imperialis*, F., *nec* Laich.). Head, thorax and scutellum black with a more or less distinct bluish reflection, head comparatively strongly punctured, antennæ black, with base reddish; thorax long, thickly and finely punctured; elytra reddish-yellow with five distinct and comparatively small black spots on each, more coarsely punctured than thorax; under-side and legs black. L. $4\frac{1}{2}$ –7 mm.

On willows and hazels; extremely rare in Britain; one specimen was taken by Dr. Power many years ago on the Gogmagog Hills, Cambridgeshire.

C. coryli, L. Black, with the antennæ ferruginous at base, and two lines near eyes yellowish, the thorax black in male and red in female, and the elytra red with the suture and basal margin very narrowly black, and sometimes with a black spot at shoulders, and rarely one or two on each elytron; head thickly and finely punctured, impressed in middle; thorax strongly convex, shining, very finely and not thickly punctured; scutellum large, black; elytra with the punctures not strong, and arranged in more or less irregular rows, which are more regular in some specimens than in others, and become more irregular behind; legs moderate, deep black. L. 6–7 mm.

Male with the fifth ventral segment impressed with a more or less obsolete fovea in the middle.

On young hazels; in woods in June; rare; Darenth Wood, Cobham, Mickleham, Headley Lane, Horsell, Box Hill, Reigate; Mr. W. G. Blatch has found it on birch

on Cannock Chase, but this is the only locality that has been recorded outside the London district.

C. sexpunctatus, L. Black, shining, with the base of the antennæ and, as a rule, the inner side of the anterior tibiæ ferruginous, and the forehead, anterior coxæ, and the femora at apex, marked with white; thorax very variable, black with yellow markings or yellow with black markings; elytra yellow with three large black spots on each, one at shoulder, one in a line with this near suture, and one behind; these, however, are very variable, and sometimes two only are present, and occasionally the posterior one is divided, so that there are four; the differences of colour in the thorax appear to be, to a certain extent, sexual; head rather strongly punctured, impressed; thorax short, finely, and not very closely, punctured; elytra confusedly and rather strongly punctured, the punctures being irregular. L. $4\frac{1}{2}$ – $6\frac{1}{2}$ mm.

Male with the fifth segment very large, broadly excavated, with the excavation in the middle divided in two by a transverse rugosity, armed at each side with a hooked spine.

Female with the pygidium furnished with two distinct tubercles.

On young hazels and birches in woods, in June, rare; Darenth Wood; Cobham; Hollington, Hastings; Lords Wood, Southampton (in some numbers 1887, Sharp and Gorham); Scotland, very rare, on hazels, Solway district; found in two or three places in Dumfriesshire.

C. bipunctatus, L.; *v. lineola*, F. = *v. sanguinolentus*, Scop. Black, shining, with the elytra very variable in colour, but in the British specimens apparently confined to one variety, which has the elytra orange or reddish-orange with a broad longitudinal black stripe on each, which is more or less variable in breadth; head rather thickly punctured; antennæ long, with the first five joints reddish or reddish-brown, at all events on the under-side; thorax smooth and shining, extremely finely punctured, the punctures being only visible under a high magnifying power; elytra with the rows of punctures variable, stronger and more regular in some specimens than in others, but usually more or less irregular, interstices flat; in punctuation, however, this and the next species form a sort of connecting link between those that precede and those that follow; the scutellum, margins and suture of elytra, and legs appear to be always black. L. 4–6 mm.

Male with the fifth ventral segment indistinctly impressed, the impression being nearly smooth.

On young birches, hazels, oaks, willows, &c.; in woods, June; very local, and not common; Darenth and Birch Woods, Chatham, Cobham, Headley Lane (Esher); Folkestone; New Forest; Portsmouth district; Bournemouth; South Wales, Swansea, &c.; Chartley Moss and Burnt Wood, Staffordshire; Trench Woods; Yorkshire; Northumberland and Durham district, rare; Scotland, very rare, Tay and Forth districts (the latter record is somewhat doubtful).

C. biguttatus, Scop. (*bipustulatus*, F.). Very closely allied to the preceding, but with the elytra more strongly punctured, and the

interstices somewhat convex; the colour is black with a spot at apex of elytra rufo-testaceous; in the male the fifth ventral segment is more strongly impressed, the impression being punctured; there is a rare variety of *C. bipunctatus*, (*v. Thomsoni*), which very closely resembles this species, but which differs, according to Weise, in having the spot at apex narrower and more in the form of a band and less rounded and widened on its anterior edge; very few specimens have occurred in Britain, and it seems still doubtful whether they should, either all, or in part, be referred to *C. biguttatus* or *C. bipunctatus*, if these two latter species be really distinct; this has been doubted by some authors, who have united them. L. $4\frac{1}{2}$ –6 mm.

On young trees; very rare; Bournemouth (Kemp Welch); Lyndhurst; Chat Moss, on *Eriophorum polystachyum*, eight specimens (Chappell).

C. aureolus, Suffr. (*sericeus*, Küst., *nec* F.). A rather large species, of a silky-green colour, sometimes golden, coppery or violaceous, shining; head rather strongly punctured, antennæ black; thorax distinctly punctured, considerably narrowed in front and strongly sinuate at base; scutellum long, raised at apex; elytra strongly and rugosely punctured, with traces of raised lines towards apex; legs metallic, all the tarsi dilated. L. $5\frac{1}{2}$ – $7\frac{1}{2}$ mm.

Male with the last ventral segment transversely impressed, emarginate at apex.

Female with the last ventral segment deeply emarginate at apex.

On flowers, especially Compositæ (*Hieracium*, &c.); locally common; London district, common, Croydon, Caterham, Mickleham, Reigate, Weybridge, Woking, Chatham, Dartford, Horsham, Dover; Portsmouth district; New Forest; Sandown; Swansea; Barmouth; Llandudno; Bewdley; Rodborough Common, Gloucestershire; Dove Dale, July 14th, 1879, on *Hieracium*; Wallasey, Cheshire; New Brighton; Blackpool; Northumberland and Durham district; not recorded from Scotland.

C. hypochæridis, L. (*sericeus*, F., *nec* Küst., L. &c.). Very like the preceding, but smaller, with the antennæ distinctly shorter, and the pygidium emarginate at apex and furnished with a more or less distinct carina; the scutellum is shorter and more raised at apex; the elytra are rather less strongly sculptured; the male has the fifth ventral segment marked with a shallower fovea which has the apex slightly emarginate and furnished with a transverse and somewhat elevated line in the middle of the posterior margin, and the female has the fovea of the fifth ventral segment deep and ciliate at base. L. 4– $5\frac{1}{2}$ mm.

On flowers of *Hieracium*, &c.; local; London district, rather common, Caterham, Croydon, Shirley, Mickleham, Darenth, Chatham, Rochester, Headley Lane; Dover; Folkestone; Hampshire; Devon (on *Crepis tectorum* (*virens*)); Northumberland and Durham district, Marsden (J. Hancock).

C. ochrostoma, Har. (*nitidulus*, Gyll.). Smaller on an average than either of the preceding, from which it may be at once known by having the base of the antennæ and more or less of the legs reddish or

yellowish-red, and the thorax extremely finely punctured, almost smooth; there is a yellow spot on the forehead, and the angles of the thorax are very narrowly, often almost imperceptibly yellowish; the elytra are less closely and rather strongly punctured in more or less irregular rows; the colour is golden or bluish-green or blue above and black beneath, but the upper surface does not present the frosted appearance so characteristic of the two preceding species. L. $3\frac{1}{2}$ –5 mm.

According to Thomson the male only has the angles of the thorax and the anterior margin narrowly yellow, and in this sex the legs are black with the anterior femora and the under-side of the anterior tibiae yellowish; in the female the anterior legs are yellow with the femora black on their upper side, and the posterior black with the tibiae yellowish on their inner side; the colour of the legs, however, appears to be variable in specimens of the same sex, and the posterior tibiae appear to be often quite black.

On young birch and hazel, in woods, in June; very local, although it sometimes occurs in some numbers where found; Darent Wood, Headley Lane, Cobham, Mickleham; the only locality that has been recorded, apparently, outside the London district is "Devon" (Steph. Manual, 2397), which may be in error, as it has never been found in the county since.

C. punctiger, Payk. Black or blue-black, shining, with the base of the antennæ, the mouth parts, a bifid spot on forehead, and the anterior legs (except the outer side of the femora, and rarely of tibiae) reddish-yellow; the prosternum, also, is more or less yellow; head finely punctured, thorax rather sparingly punctured, more distinctly in the males than in the females; elytra cyaneous, sometimes greenish-blue, with strong and deep rows of punctures; the general form is more elongate and narrower than in *C. parvulus* (*fulcratus*), which is its nearest ally among the British species; from this species, however, it may at once be known by the more or less red anterior pairs of legs. L. $2\frac{1}{2}$ – $3\frac{1}{2}$ mm.

Male with the frontal spot larger, the anterior margin of thorax yellow, and the intermediate femora and tibiae nigro-fuscous on their upper side.

Female with the posterior angles and the anterior margin of thorax usually very narrowly yellow.

On young birches, hazels, willows, &c.; in woods; not common; Lee and Darent Wood (Waterhouse, Champion, &c.); Llangollen (Reston); Cannock Chase, on birch, local (Blatch); Burnt Wood, Staffordshire (Chappell).

C. parvulus, Müll. (*nigrocæruleus*, Goeze; *flavilabris*, F., *nec* Suffr.; *fulcratus*, Germ.). Of a bright blue or greenish-cyaneous colour, with the antennæ dark, basal joints, at least on under-side, testaceous, mouth parts yellow; head closely punctured; thorax more strongly punctured in the males than in the females, and more closely at sides than on disc, impressed at sides of disc, and more strongly in middle of base; elytra

with strong rows of punctures, interstices almost smooth; legs dark, metallic, trochanters testaceous. L. $3-4\frac{1}{2}$ mm.

In this and several other species the punctuation of both thorax and elytra is stronger in the males than in the females; the latter sex is almost universally the largest.

On young birches, &c.; local, but sometimes common where it occurs; Darent and Birch Woods; Croydon; Woking; Chobham; Hastings; Lords Wood, Southampton; Llangollen; Chartley Moss and Burnt Wood, Staffordshire; Scotland, Ross-shire, Glen Affrick, on birch, 1884 (Rev. C. T. Cruttwell).

C. decemmaculatus, L. (*decempunctatus*, L.). Head black, with the mouth parts and a cordate frontal spot testaceous, distinctly punctured, eyes at their lower margin reaching a little beyond the anterior angles of the thorax, antennæ black, with the first five or six joints reddish; thorax rather long, diffusely and distinctly punctured, yellow with four black spots which are often confluent and very variable; elytra with rather strong regular rows of punctures, yellow or whitish-yellow with five spots on each (arranged 2, 2, 1), the two behind middle being often confluent at suture; these spots, however, are very variable, sometimes the greater part of the elytra being black and sometimes yellow; legs more or less pitchy yellow; under-side black. L. $3\frac{1}{2}-4\frac{1}{2}$ mm.

Male with the fifth ventral segment slightly impressed behind transversely.

On the dwarf willow; rare; taken in June, 1865, in some numbers at Camachgowran, Loch Rannoch, Tay district of Scotland, by Dr. Sharp, Mr. Rye, and Mr. Hislop, and in 1866 by Mr. Harris and Mr. W. Garneys at Chartley Moss, Staffordshire; these latter specimens were, I believe, found on birch.

V. bothnicus, L. This variety has the upper surface entirely black, with the cordate frontal spot, and a longitudinal broader or narrower band or line on the front of the thorax testaceous; the anterior margin of the thorax is also, as a rule, narrowly testaceous; in other points it resembles the type.

Found with the type form; in Scotland it is the most common form, but Mr. Garneys found the ordinary form most common on Chartley Moss, Staffordshire.

C. moræi, L. Black, shining, sometimes with a slight æneous reflection, with the basal joints of the antennæ, at all events on their under-side, the posterior angles of thorax, and a spot at apex and another near side margin of elytra yellow or whitish-yellow; head varying in colour in the sexes, antennæ long, eyes on their lower sides not reaching the anterior angles of thorax; thorax very finely punctured; elytra with strong and coarse rows of punctures, external interstices somewhat convex; legs black, partially pitchy or pitchy yellow, sometimes yellow, anterior femora more or less whitish on their inner margin, process of prosternum yellowish behind, bimucronate. L. 3-5 mm.

Male with the anterior margin of thorax and an X-shaped mark on forehead yellow.

Female with two yellowish lines near eyes.

By sweeping herbage, &c.; often found on flowers; local, but not uncommon in some districts; Reigate, Caterham, Kenley, Mickleham, Coombe Wood, Esher, Tonbridge, Croydon, Betteshanger Park (Kent); Chatham; Hastings; Arundel; Sandown; Portsmouth district; New Forest; Glanvilles Wootton; Bath, on *Hypericum perforatum*; Swansea; Llangollen; Bewdley Forest; Northumberland and Durham district, rare; Scotland, rare, on *Hypericum*, Solway, Tweed, and Sutherland districts.

C. bilineatus, L. A very pretty and distinct little species, which may at once be known by its colour, and the fact that the thorax is very plainly, although finely, strigose, so that it presents a dull appearance; head varying in the sexes, antennæ black, with base reddish; thorax black with the anterior and side margins narrowly yellow; elytra yellow with the suture and a longitudinal band on each black, with strong and regular rows of black punctures; legs yellow-red; under-side black. L. 2-3 mm.

Male with the head yellow, with a central line on forehead black, and with the first joint of the tarsi dilated; sometimes, however, the head in this sex is coloured as in female.

Female with the head black with two yellow frontal spots.

V. armeniacus, Fald. This variety has two yellow spots before the scutellum.

By sweeping herbage; local, but not uncommon in some districts; Lee, Reigate, Dorking, Mickleham, Caterham; Whitstable; Birchington; Folkestone; Eastbourne; Arundel; Portsmouth district; Sandown and Freshwater, Isle of Wight; Bristol; Norfolk.

The variety appears to be found with the type; of seven specimens in my collection, two only belong to the type form.

C. fulvus, Goeze (*minutus*, F.). A small species, rather short and broad, of a rufo-testaceous colour, with the elytra yellow, and the suture narrowly infusate; the colour, however, varies considerably (although less than in the succeeding species), the elytra being often marked with dark spots at shoulders and sides; head flat, with two furrows near eyes, unicolorous or with the centre darker, antennæ long, fuscous towards apex; thorax convex, smooth and shining; elytra with regular rows of punctures, which are distinct at apex; prosternum with no labial process; under-side black; legs yellow with the posterior femora sometimes more or less dark. L. 2-3 mm.

Male with the first joint of the anterior tarsi strongly dilated.

By sweeping herbage; local, but not uncommon in some districts; Weybridge, Caterham, Coombe Wood, Ripley, Forest Hill, Chatham, Cobham, Sydenham, Rusper, Dulwich, West Wickham, Sheerness; Broadstairs; Hastings; Hampshire; Glanvilles Wootton; Devon; Barmouth; Church Stretton; Askham Bog, York; Newcastle-on-Tyne (Wales); it has not been recorded from Scotland.

C. pusillus, F. Very closely allied to the preceding, with which it is sometimes confused; the colour, however, is more variable, the elytra in extreme varieties being entirely black with only a marginal line and

the apex testaceous; this is the *v. Marshami*, Weise (*C. marginellus*, Marsh.); but the insect presents every shade of variation between this and being entirely fulvous, with the under-side and apex of antennæ black; the species may be known from *C. minutus* by having the striæ almost effaced for posterior third, and the fact that the prosternum has a long and sharp labial process; in the male the antennæ are as long as the body, and the first joint of the anterior tarsi is strongly dilated and half as long again as the third; in the female these joints are nearly equal. L. 2-3 mm.

On young birches, &c., in woods; also by sweeping heath; local, but rather common in several localities; Ashted, Shirley, Weybridge, Forest Hill, Dorking, Cobham, Darenth Wood, Chatham, West Wickham, Southend; Hastings; Bournemouth; Glanvilles Wootton; Devon; Knowle; Needwood; Bretby, near Repton; Sherwood; Chat Moss, Staffordshire; it has not been recorded from further north.

C. labiatus, L. Black, shining, with the base of the antennæ, the face and mouth parts below the antennæ, and the anterior legs, except the femora, and more or less of the posterior pairs, yellow; thorax short, very smooth and shining, scarcely visibly punctured; elytra with strong rows of punctures, which are much finer behind middle, and are almost effaced for posterior third, prosternum with a central keel which is raised in front and with the prosternal process slightly emarginate. L. 2-3 mm.

Male with the antennæ longer and the anterior tarsi with the first joint dilated and longer than the third.

On young birches, hazels, oaks, &c.; in woods and hedges; generally distributed and common throughout the greater part of England, and not uncommon in Scotland; it is the commonest of our British species, and often occurs in abundance.

C. querceti, Suffr. (*geminus*, Wat Cat.). Very like the preceding, but larger and rather longer, with the anterior legs entirely yellow, and the labial process of the prosternum much shorter; as a rule the antennæ are entirely yellow or pitchy yellow, but this is not always the case; the intermediate and posterior legs are also yellow, the posterior femora being broadly black on their outer side; the first joint of the anterior tarsi is elongate and only moderately dilated in the male, triangular in the female. L. 3-3 $\frac{1}{4}$ mm.

On oaks and birches; very rare; as far as I know it has only occurred in Sherwood Forest, where it has been taken by the Rev. A. Matthews, Mr. Blatch, and others; the *C. geminus* of Waterhouse's catalogue, which has been supposed to be this insect, has been recorded as taken in Devonshire on the barberry.

C. exiguus, Schneid. (*Wasastjernæ*, Gyll.). This is the smallest of the British species; superficially it much resembles *C. labiatus*, from which it may be known by having the thorax closely covered with small and very fine striæ, which are, however, by no means as pronounced as in *C. bilineatus*, and require a considerable magnifying power to show them distinctly; the punctured striæ of the elytra also

almost if not quite reach the apex; the base of the antennæ and the legs are yellow, the posterior femora and more or less of the posterior tibiæ being infusate. L. $2-2\frac{1}{2}$ mm.

Male with the head, except a central line, yellow, anterior tarsi with the first joint strongly dilated.

Female with the head black, the clypeus and labrum being reddish-yellow.

On willows, and on flowers in damp meadows near woods; according to Mannerheim it occurs on *Carduus heterophyllus* in shady places; very rare in Britain; taken in some small numbers by Dr. Power in Horning Fen, Norfolk.

C. frontalis, Marsh. This is another of the black species that may easily be passed over at first sight as *C. labiatus*, from which it may be known by having the anterior margin of the thorax narrowly yellow, and the fact that in the male the whole forehead, and in the female a cordate spot on the same, is yellowish or rufo-testaceous; the apex of the scutellum, as a rule, and the epipleuræ of the elytra are also yellow; the thorax is smooth, scarcely visibly punctured, and the elytra have the rows of punctures distinct almost to apex; legs yellow or reddish-yellow, anterior femora dark on their upper side. L. 2-3 mm.

On birch and willows; rare; recorded by Stephens from the London district and Suffolk; Rusper, near Horsham (Gore and Gorham); Stroud, near Gloucester (Blatch).

(*C. violaceus*, Laich. Of an obscure cœruleo-violaceous colour above, under-side black; thorax finely and rather sparingly punctured; scutellum almost smooth; elytra not very strongly and somewhat rugosely punctured, with the apical angles entirely rounded. L. 4-7 mm.

There is an old specimen of this species in Dr. Power's collection, labelled "Cambridge," and one or two others have been recorded; it must, however, be regarded as doubtfully indigenous, without further confirmation.

(*C. vittatus*, F., is also represented in several collections, but it appears to be most probable that all the specimens originally came from Jersey.

CYCLICA.

This is by far the largest of the divisions of the Phytophaga, and contains a great number of genera and species which are perpetually being added to. The following are its chief characteristics:—Head with no neck or a very short one; antennæ variable, but, as a rule, distinctly moniliform; head usually sunk in thorax as far as eyes, rarely free; thorax as a rule broader than long, nearly always margined at sides, and in the typical genera as broad at base as elytra; in many of the latter genera, however (*Luperus*, *Galeruca*, *Longitarsus*, &c.), it is often plainly narrower than the elytra; scutellum in the same plane as the elytra; legs as a rule rather short and stout, but in some genera elongate;

abdomen with the segments free ; tarsi with the last joint much longer than the penultimate.

- I. Antennæ widely distant at base, inserted on the forehead above the base of the mandibles.
 - i. Anterior coxal cavities round ; third joint of the tarsi always bilobed EUMOLPINA.
 - ii. Anterior coxal cavities transverse ; third joint of the tarsi either entire, emarginate or bilobed at apex CHRYSOMELINA.
- II. Antennæ approximate or comparatively approximate at base, usually inserted on the forehead between the eyes GALERUCINA.

EUMOLPINA.

This important tribe contains upwards of one hundred and fifty genera, which, however, for the most part contain only a small or comparatively small number of species ; they are chiefly found in tropical countries, only eleven genera and twenty-six species occurring in Europe ; one only is found in Britain, *Lamprosoma* (*Oomorphus*) *concolor*, which in the Munich catalogue is classed with the genus *Lycnophæës* under a separate tribe *Lamprosomina* ; the Eumolpina are chiefly distinguished by having the clypeus emarginate, the antennæ broadly distant at base and inserted on the forehead behind the base of the mandibles, the anterior coxæ round, and the tarsi with the penultimate joint plainly bilobed.

LAMPROSOMA, Kirby. (*Oomorphus*, Curtis.)

This genus contains, as far as is at present known, about one hundred and twenty species, of which no less than thirty-nine have been described since the publication of the Munich catalogue ; the majority of the species are found in Central America and Brazil, Cayenne, Bolivia, &c., but a few have been described from North America, Cuba, and other neighbouring localities ; only one species occurs in Europe, which was described by Curtis ; its position for some time was much disputed ; Stephens placed it near *Simplocaria* with the Byrrhidæ ; it is a small and very shining black insect, and at first sight strongly resembles a *Phædon* ; the head is small and sunk in the thorax, and the mandibles are short and stout ; the antennæ are received in furrows on the pro-sternum, and are short ; the mesosternum is hidden ; the legs are stout, with the tarsi dilated, and the claws are thin and small.

L. concolor, Sturm. Ovate, very convex, shining black with a slight bronze reflection ; head exceedingly finely wrinkled, antennæ short with joints 7, 9, 10, and 11 thickened, the 8th being smaller, 2nd joint red ; thorax transverse, much narrowed in front, rather thickly and finely punctured ; scutellum small ; elytra with rather fine rows of larger punctures, interstices broad and very finely and diffusely punctured ; legs black, claws very small ; the punctuation is rather stronger in certain larger specimens, which are perhaps females. L. 2-3 mm.

By sweeping herbage, and occasionally by beating low shrubs; sometimes found in moss; London district, not uncommon, Lee, Darenth Wood, Highgate, Caterham, Peckham, Warlingham, Reigate, Birch Wood, &c.; Dover; Folkestone; Hastings; Isle of Wight; Glanvilles Wootton; Plymouth, Haldon, and Seaton, Devon; Falmouth; Barmouth; Tewkesbury; Matlock; Northumberland district, rare, Bothal; not recorded from Scotland; Ireland, Woodlands, Dublin (Power), and Galway, common (J. J. Walker).

CHRYSOMELINA.

This tribe contains about seventy genera, of which eighteen occur in Europe; the most important in point of numbers are *Chrysomela*, *Doryphora*, and *Paropsis*; the two latter of these are not found in Europe, but *Chrysomela* appears to hold its own throughout the greater part of the world; next to this genus *Timarcha* and *Orina* are the chief European genera; the tribe is fairly represented in Britain by ten genera, but the number of species does not come up to this proportion, only forty being found out of two hundred and eighty which are inhabitants of Europe; the characters of the tribe are hard to define with any certainty; it is closely allied to the Eumolpina, from which it chiefly differs in having the anterior coxal cavities transverse instead of round: Weise (l.c. p. 276) gives as an additional character that the third tarsal joint is bilobed (zweilappig) in the Eumolpina, whereas it is entire or emarginate at the apex in the Chrysomelina; in the table of genera, however (l.c. p. 303), he separates off one of the larger divisions of the latter tribe (containing *Phædon*, *Hydrothassa*, and *Prasocuris*) as having the tarsi with the third joint "apice evidentiter sinuato, bilobo," whereas the division containing *Plagioderia* and *Melasoma* is said by him to have the third joint "apice obsolete vel haud sinuato;" when, however (l.c. p. 552), he is discussing the characters of *Melasoma* (*Lina*), he states that the third joint of the tarsi is bilobed (zweilappig) in half the German genera, and in the rest emarginate at apex. I have discussed this particular point somewhat at length, as it shows that the characters of the whole group are very unsettled; as a matter of fact, nearly all the members of the tribe appear to be strongly bilobed, as the onychium arises from the neighbourhood of the base of the third joint which is usually deeply channelled; the character therefore must be ascertained from below, and as the joints are often thickly pubescent it is in many cases hard to determine whether the lobes are divided or not; as a matter of fact this appears to be comparatively seldom the case among the Chrysomelina; the head is rather deeply sunk in the thorax and the eyes are entire; the clypeus is subtruncate with the anterior margin transversely depressed; the antennæ are usually moniliform with the five or six last joints often somewhat thicker, and are inserted on the forehead behind the base of the mandibles; the anterior coxal cavities are transverse, and as a rule, but not always, are open behind; the thorax is closely applied to the elytra, and is usually as broad or nearly as broad as their base; the abdomen, as in the rest of the Phytophaga, is com-

posed of five ventral segments; the general form is oval and convex, and many of the species are very brilliantly coloured (hence their name), but they differ very considerably in both these characters. In the following table I have entirely dropped the characters drawn from the tarsal joints, and have adopted more simple ones which may not in all cases be of universal application, but will for the most part enable the British genera to be distinguished with more or less ease.

- I. Anterior coxal cavities closed behind; metasternum very short. TIMARCHA, Latr.
- II. Anterior coxal cavities open behind.
 - i. Prosternum without distinct process behind; thorax margined at base; tibiæ produced into a tooth externally at apex GASTROIDEA, Hope.
(*Gastrophysa*, Redt.)
 - ii. Prosternum with a distinct process behind.
 - 1. Elytra with their inner posterior margin very finely ciliated; * form ovate or short ovate and convex; abdomen with the first ventral segment longer than the metasternum CHRYSOMELA, L.
 - 2. Elytra with their inner posterior margin not ciliated.
 - A. Tarsal claws toothed.
 - a. Tibiæ, at least the posterior pair, produced externally into a more or less strong tooth at apex PHYTODECTA, Kirby.
(*Gonioctena*, Redt.)
 - b. Tibiæ not produced externally into a tooth at apex PHYLLODECTA, Kirby.
(*Phratora*, Chevr.)
 - B. Tarsal claws simple.
 - a. Elytra not punctured in distinct rows, usually confusedly punctured.
 - a*. Elytra with the epipleuræ not sharply inflexed, almost flat; size larger MELASOMA, Steph.
(*Lina*, Redt.)
 - b*. Elytra with the epipleuræ strongly and sharply inflexed against the under-side; size smaller (facies of *Phædon*) PLAGIODERA, Redt.
 - b. Elytra punctured in distinct rows.
 - a*. Form short oval and convex PHÆDON, Latr.
 - b*. Form oblong, elongate-oblong, or oblong oval.
 - a†. Thorax transverse, not margined at base; form shorter HYDROTHASSA, Thoms.
 - b†. Thorax subquadrate, margined at base; form longer PRASOCURIS, Latr.

TIMARCHA, Latreille.

This genus contains about a hundred species, which are chiefly confined

* This character in some species is very marked, under a high magnifying power, but in others is less evident and sometimes requires the removal of the elytra for its proper examination.

to Europe and Northern Africa ; a few, however, have been described from Northern Asia and North America ; they are, as a rule, large and conspicuous insects, of a dull black or dark metallic bronze colour ; they are characterized by having the mentum large and emarginate, the anterior coxal cavities closed behind, the metasternum very short, and the femora projecting considerably beyond the margin of the elytra ; the thorax is truncate at base and margined, and the elytra are subglobose and convex ; the legs are rather long and the tarsi are broad and have the first three joints strongly dilated in the males, which are smaller than the females. *T. tenebricosa*, F. (*lævigata*, Duft.), is the largest of our indigenous Phytophaga ; it is very slow in its movements, and has the power of ejecting a brilliant red fluid from its mouth when alarmed, from which peculiarity it has acquired the name of the "Bloody-nosed beetle" ; its larva is described and figured by Westwood (Classification, vol. i., p. 387-8, fig. 48, 2) ; it is thick, fleshy, and wrinkled, of a greenish-black colour, with the extremity of the body and under-side dark brown or blood-coloured ; the body is narrowed in front and behind, and four or five of the terminal segments of the abdomen are furnished beneath with small raised tubercles serving as prolegs, and there is also one at the anal extremity ; the head has six ocelli on each side, and the legs are of moderate size ; when alarmed the larva rolls itself up, somewhat after the manner of a woodlouse.

The larvæ of *Timarcha* appear closely to resemble those of *Chrysomela*, and to differ chiefly in having eight pairs of stigmata instead of nine, as is the case in the latter genus.

Of the sixty-four European species only two are found in Britain ; these may be distinguished as follows :—

- | | |
|---|--|
| I. Thorax dilated in middle and strongly contracted behind ; elytra finely punctured ; size larger . . . | <i>T. TENEBRICOSA</i> , F.
(<i>lævigata</i> , Duft.) |
| II. Thorax not dilated in middle with sides slightly rounded and scarcely contracted at base ; elytra coarsely punctured ; size smaller | <i>T. VIOLACEONIGRA</i> , De G.
(<i>coriaria</i> , Laich.) |

T. tenebricosa, F. (*lævigata*, Duft.). A large and conspicuous species, broad oval, very convex, upper side dull black, usually with a very slight greenish or bluish reflection, under-side obscurely bluish or violet ; head, especially the clypeus, rather strongly punctured, antennæ rather short and stout, with the first six joints metallic and strongly punctured ; thorax double as broad as long, dilated in middle, and strongly contracted behind, rather finely punctured ; elytra shallowly and finely punctured, with the punctures, especially in female, often united by engraved lines ; legs rather stout with the tarsi dilated. L. 11-18 mm.

Male smaller and more shining than the female with the tarsi more

strongly dilated; female with the first joint of the tarsi furnished beneath with a smooth line.

On grass in lanes and by the side of roads, on commons, heaths, &c.; often crawling on pathways; very common and generally distributed from the midland counties southwards, but rarer further north, and not recorded from the northern counties of England; the single Scotch record, "Kirkcudbrightshire, Murray's Cat.," is extremely doubtful; it is local in Europe, being chiefly confined to southern and south-central districts; it is not recorded from Scandinavia. Mr. Gorham records it as general in the South of England on *Galium*, but I have not observed its preference for this plant.

T. violaceonigra, De G. (*coriaria*, Laich.). This species is much smaller than the preceding, the males being about the size of a large *Chrysomela distinguenda*; it may be easily distinguished by having the sides of the thorax very slightly and uniformly rounded, and scarcely contracted behind, and by the much coarser rugose sculpture of the elytra; the colour is always dark, but is somewhat variable as regards the metallic reflection, which is, as a rule, slightly violet, but sometimes bluish or greenish; the sexual characters are as in *T. tenebricosa*. L. 8-13 mm.

Heaths and commons; on grass stems, furze, *Galium*, &c.; common and generally distributed throughout England from the midland counties southwards; rarer further north, and not recorded from the extreme northern counties of England, or from any Scotch district except the Orkney Islands; Ireland, near Belfast and Dublin; it has a much wider northern range in Europe than the preceding species.

CHRYSOMELA, Linné.

The genus *Chrysomela* proper contains upwards of four hundred species, which are widely distributed in the Old World; about a hundred and twenty are found in Europe, and a large number inhabit Northern Asia and South Africa; very few appear to be found in the New World; four or five have recently been described from Peru, and a few representatives have occurred in North America, Mexico, Chili, Australia, &c.; the genus appears to be replaced in North, Central and South America by *Calligrapha* and *Zygogramma*, which are regarded by Dr. Horn as merely sub-genera of *Chrysomela*, and chiefly differ in having the elytra furnished with labyrinthine spots or stripes.

The species are ovate or short ovate insects, and, as a rule, are strongly convex; they vary exceedingly in colour from black or bluish-black to the most brilliant golden green, purple, red, blue, coppery, &c.; some of the species are among the most beautiful of the Coleoptera; they differ from the closely allied genus *Timarcha* in having the anterior coxal cavities open behind, and in the fact that the posterior femora project either slightly, or not at all, beyond the margin of the elytra; the mentum is large, and the episterna of the metathorax are elongate triangular and narrowed towards apex; the elytra are very variably punctured, and are finely but distinctly ciliate on their inner posterior margin;

the legs and tarsi are rather stout, and the latter are more or less dilated, especially in the males; the males, moreover, are usually smaller and narrower than the females, and have the last segment of the abdomen subtruncate, sinuate or impressed.

The larvæ of *Chrysomela* are of longer or shorter oval form with narrow head and thorax and strongly widened abdomen which is very convex; the upper surface is smooth or slightly pubescent and variously coloured; they differ from *Timarcha* in having nine pairs of stigmata instead of eight; they feed on various plants, to which they sometimes do considerable damage by eating large holes in the leaves.

There are sixteen British species belonging to the genus, which may be roughly distinguished as follows:—

- I. Elytra with the margins broadly yellowish-red or red and not metallic.
 - i. Elytra confusedly and rugosely punctured; size larger.
 1. Form longer; sculpture of elytra more confluent C. SANGUINOLENTA, L.
 2. Form shorter; sculpture of elytra less confluent C. MARGINALIS, Duft.
(*distinguenda*, Steph.)
 - ii. Elytra finely punctured with distinct rows of larger punctures C. MARGINATA, L.
- II. Elytra unicolorous, or with the side margins metallic.
 - i. Thorax with the side margins strongly raised.
 1. Elytra bronze, reddish-bronze, or brownish-red.
 - A. Thorax and elytra concolorous.
 - a. Size larger; upper surface metallic, with coarse and irregular punctuation C. BANKSI, F.
 - b. Size smaller; upper surface not, or scarcely, metallic, with more or less irregular rows of rather fine punctures C. STAPHYLEA, L.
 - B. Thorax golden green C. POLITA, L.
 2. Elytra steel-blue with very regular single rows of rather large punctures C. ORICHALCIA, Müll.
(*lamina*, F.)
 - ii. Thorax with side margins not, or slightly, raised.
 1. Elytra with more or less regular double rows of moderate punctures on disc; colour steel-blue C. HÆMOPTEBA, L.
 2. Elytra irregularly punctured.
 - A. Form short, subglobose.
 - a. Colour very variable; punctuation coarser; size smaller C. VARIANS, Schall.
 - b. Colour deep violet; punctuation finer; size larger C. GOETTINGENSIS, L.
 - B. Form more oblong, as a rule, more depressed, but sometimes strongly convex.
 - a. Colour brilliant golden green, unicolorous, or partly bluish or coppery.
 - a*. Thorax with disc more coarsely punctured, and with sides distinctly narrowed in front, broadest at base; elytra unicolorous; length 7–9 mm. C. MENTHRASTI, Suffr.
 - b*. Thorax with disc more finely punctured, and with sides not, or scarcely, narrowed in front, broadest about middle, or as broad in middle as at base.

- a†. Length 8–11 mm.; form convex; elytra with suture and margins obscurely bluish, or coppery C. GRAMINIS, L.
- b†. Length 5–7 mm.; form depressed; elytra with the suture broadly blue, and a broad longitudinal blue band on each C. FASTUOSA, Scop.
- b. Upper surface marked with longitudinal bands of brilliant green, red, purple and copper colour C. CEREALIS, L.
3. Elytra confusedly punctured, with more or less distinct rows of larger punctures.
- A. Larger punctures small and arranged near together, interstices comparatively strongly punctured C. DIDYMATA, Scriba.
- B. Large punctures very coarse and arranged at the sides in pairs, interstices very finely punctured C. HYPERICI, Forst.

C. sanguinolenta, L. Of rather long oval, elliptic form, deep black, sometimes with a bluish reflection, margins of the elytra red; antennæ thickened towards apex, with the first two joints yellow underneath; thorax very transverse, with the side margins raised, disc finely and moderately closely punctured; elytra rather long with coarse punctuation which is confluent; legs black, rather stout. L. 7–9 mm.

Male with the three first joints of the tarsi strongly dilated, and the last ventral segment of the abdomen somewhat swollen.

On dry grassy places and sandy hills; local; Scotland, local, Clyde, Sutherland, Orkney, and Shetland districts.

C. marginalis, Duft. (*distinguenda*, Steph. *C. sanguinolenta*, var., (?) auct.). Very like the preceding, but differing by its bluer colour, shorter and more oval form, and the less confluent punctuation of the elytra; the antennæ also are less thickened and the disc of the thorax is almost smooth; the colour of the side margins of the elytra and of the under-side of the first two joints of the antennæ is also brighter and more marked. L. 7–8 mm.

Grassy places; on the flowers of *Linaria*, &c.; local; London district not uncommon; Chatham, Belvedere, Plumstead, Croydon, Cowfold, Boundstone; Gorleston, Norfolk; Pegwell Bay; Abbey Wood; Southampton; Swansea; Malvern; Scotland, rare, Forth district.

C. marginata, L. Oblong, moderately convex, upper surface bronze or reddish-bronze, with the thorax often darker than the elytra, which have a broad and well-defined yellowish-red border; head very finely punctured, antennæ dark with base red; thorax diffusely and finely punctured on disc, coarsely at sides where there is a trace of a raised fold, especially at base; elytra more shining in male than in female, finely punctured, with rows of larger punctures; legs pitchy. L. 5–7 mm.

Male with the elytra shining, the anterior tarsi strongly dilated, and the last ventral segment of the abdomen slightly convex.

Female with the elytra presenting a dull and somewhat silky appearance, and the interstices between the larger punctures slightly raised, and the last ventral segment of the abdomen even.

In sandy and grassy places, especially near rivers and streams; rare; Southend; Pegwell Bay, Kent; Swansea; Barmouth; Northumberland district, Cheviots, &c.; Scotland, rare, Solway, Forth, Dee, and Moray districts (Edinburgh, Knockleith, Braemar, &c.); it is widely distributed over Europe and North Africa and the northern half of Asia.

C. Banksi, F. The largest of our British species; form broad and short oval, rather depressed, upper surface very shining, bright bronze, often with an olivaceous reflection, antennæ, mouth parts, and sometimes front of head and sides of thorax, and the legs, lighter or darker red or ferruginous; head diffusely punctured; thorax narrowed in front, with sides strongly raised, disc very finely punctured, almost smooth; elytra very irregularly and more or less coarsely punctured, the punctures being thicker and larger towards sides; towards suture the punctures are smaller, and sometimes arranged in rows; the punctuation, however, is very variable; prosternum narrow between coxæ; legs rather long. L. 7-11 mm.

Male with the last joint of the palpi and the tarsi moderately dilated, and the fifth ventral segment truncate.

Chalky and sandy places; on grass stems, &c.; local, but not uncommon where it occurs; Dartford, Plumstead, Gravesend, Belvedere, Darenth, Birch Wood; Colchester; Southend; Folkestone; Dover; Hastings; Portsmouth district; Isle of Wight; Weymouth; Devonshire, Exeter, Ilfracombe, &c.; Isle of Man; Scotland, extremely rare, Clyde district, "Ayrshire, McNab;" Ireland, Dublin, Wicklow, Carlingford, &c.

C. staphylea, L. (*lepida*, Steph.). Oval, convex, male of squarer form and more shining than the female, entirely ferruginous, usually with a bronze or slight olivaceous reflection; head diffusely and finely punctured; thorax very transverse, with sides strongly raised, disc very finely punctured; elytra not strongly punctured in irregular double rows; prosternum rather broad between the coxæ; legs moderately long. L. 6-8 mm.

Male with the tarsi and the last joint of the palpi moderately dilated, and the fifth ventral segment of abdomen truncate at apex.

By sweeping herbage; often found in moss and crawling on the stems of grass; common and generally distributed throughout the kingdom as far north as the Shetland Islands.

Dr. Sharp has taken a dull variety of this species in salt marshes in the Solway district, in some numbers, which has no metallic reflection, and the head and disc of thorax nearly impunctate; the double rows of punctures on the elytra are coarser and more distinct, and the general size is smaller; this variety in some points agrees with *v. Lederi*, Weise, but that insect has the upper surface olivaceous, whereas the specimens taken by Dr. Sharp are dull ferruginous with the thorax usually darker. I therefore propose for it the name of *v. Sharpi*.

C. polita, L. Oval, convex, of a golden-green colour with the elytra reddish-brown, sometimes with a slight metallic reflection, and the breast bluish-green; antennæ pitchy with basal joints red on under-side; head diffusely punctured; thorax with sides strongly raised, disc finely punctured, more or less coppery; elytra rather sparingly, finely and unevenly punctured, the punctures being arranged somewhat in rows near suture; legs metallic, greenish or bluish. L. 6-7 mm.

Male with the fifth ventral segment of abdomen subtruncate at apex.

Grassy places; by sweeping, &c.; often found in moss; common and generally distributed throughout England and Wales, and probably the greater part of Scotland and Ireland.

C. orichalcia, Müll. (*lamina*, F.). Elliptical, convex, shining, of a deep steel-blue colour, antennæ and tarsi pitchy black, the former with the under-side of the first two joints testaceous, claws yellow; thorax narrowed in front, with sides strongly raised, shining and impunctate; elytra with regular single rows of rather large punctures, interstices broad and almost smooth, being obscurely alutaceous and very finely punctured. L. 6-8 mm.

Male smaller than the female, with the three first joints of the tarsi dilated.

Grassy places; local, but widely distributed, and often not uncommon where it is found; London district, Plumstead, Croydon, Barnes, Mickleham, Darenth, Belvedere, Sanderstead, Coombe Wood, &c.; Abbey Wood; Glanvilles Wootton, rare; Barnwood, Gloucester; Alcester; Lincoln; York; Manchester district; Northumberland and Durham district; Scotland, very rare, Solway and Tweed districts; Ireland, near Dublin.

V. Hobsoni, Steph. (*C. Hobsoni*, Steph. Ill.). This variety has the upper surface deep black with a more or less strong æneous reflection, the thorax being sometimes quite brassy.

Manchester, in abundance (Stephens); Crohamhurst (Surrey) and Honington (Power).

C. hæmoptera, L. Very like the preceding at first sight, but shorter and rounder, and easily known by having the thorax distinctly punctured and its sides not raised, and by the more or less regular double rows of punctures on the disc of the elytra; the punctuation at the sides is thicker and coarser and more confused; the colour is deep steel-blue with the thorax sometimes slightly violaceous or coppery; black varieties occasionally occur; in the male the last joint of the palpi, and the tarsi, are moderately dilated. L. 6-6½ mm.

On sandy coasts; local, but usually common where it occurs; Sheppy; Pegwell Bay; Deal; Sandwich; Portsea; Isle of Wight; Chesil Beach; Cornwall, Mawgan, St. Columbs, and Whitsand Bay; Westward Ho, Devon (very abundant on rushes, &c., on the golf links in damp places at the end of August); Teignmouth; Liverpool district; Northumberland and Durham district; Scotland, rare, Forth district.

C. varians, Schall. A small, short-oval and very convex species;

colour extremely variable, usually coppery with the thorax greenish or bluish, but sometimes entirely coppery, metallic green or bluish-green, violaceous, deep blue, cyaneous-black, or black; head diffusely punctured, antennæ black, with the first joint coloured like the upper surface; thorax short, narrower in front than behind, thickly and finely punctured; elytra irregularly, thickly and rather strongly punctured, with an intermixture of finer punctures; legs metallic. L. $4-5\frac{1}{2}$ mm.

Male with the last ventral segment truncate at apex and impressed with a small fovea.

Grassy places; by sweeping, &c.; local, but not uncommon in many districts; London district, rather widely distributed; Hastings; Holm Bush, Brighton; New Forest; Swansea; Barmouth; Dean Forest; Bewdley Forest; Burnt Wood, Staffordshire; Matlock; Teesdale (an entirely green variety taken by Rev. W. C. Hey); Northumberland and Durham district; Scotland, local, Solway, Tweed, Forth, and Moray districts.

C. goettingensis, L. Oval, violaceous, with the base of the antennæ, the palpi, and the tarsi ferruginous; head diffusely and finely punctured, antennæ rather long; thorax very transverse, with sides slightly rounded, more narrowed in front in the male than in the female, thickly and finely punctured, sides more strongly punctured; elytra thickly punctured, the punctuation being fine and consisting of larger and smaller punctures intermingled; legs, except tarsi, obscurely violaceous. L. $6\frac{1}{2}-9$ mm.

Male with the last joint of the maxillary palpi, and the tarsi, strongly dilated.

Sandy and chalky places; under stones, on grass stems, &c.; not common; Beckenham, Darenth Wood, Sittingbourne, Chatham, Chiselhurst, Orpington, Belvedere, Croydon, Guildford, Ashford, Addington, Bromley, Mickleham; Hertford; Folkestone; Southwold; Alverstoke; Porlock, near Exmoor, Devon; Bath; near Burton-on-Trent; Stephens records it from Edinburgh, but this is probably an error, as it has not been recorded from any of the more northern counties of England, nor does Dr. Sharp include it in his Scotch list.

C. graminis, L. A large and conspicuous species, oblong-oval, very convex, of a bright golden-green colour, with the thorax, suture, and a more or less obscure band on elytra bright green or blue, margins of elytra usually coppery; head diffusely punctured, antennæ rather long, metallic, basal joints usually more or less ferruginous; thorax with sides very slightly rounded, broadest about middle, with the disc diffusely and finely punctured, sides coarsely punctured; elytra thickly and strongly and almost rugosely punctured, with very fine punctures and scratches in the interstices; legs metallic green. L. $7\frac{1}{2}-10\frac{1}{2}$ mm.

Male smaller than female, with the anal segment thickly pilose, and the last ventral segment of the abdomen somewhat swollen, impressed with a central line, and truncate at apex.

In marshy places; on *Tanacetum vulgare*, also on species of *Mentha*, and on willows; local, and chiefly confined to the fen districts; Soham and Wicken Fen, Cambridge (in numbers); Ely; Burwell Fen; Huntingdonshire; Bretby Park, near Burton-on-Trent (E. Brown); Archdeacon Hey used to take it in some numbers on tansy near York, and it has occurred at Dover.

C. menthrasti, Suffr. Very like the preceding in general appearance, but of somewhat more depressed form, and, as a rule, more widened behind; it may also be known by its unicolorous elytra and the fact that the thorax is gradually and gently narrowed in a straight line from base to apex, and has the disc more strongly punctured; the elytra are rather more finely punctured, and usually show faint traces of two slightly elevated lines; in the male the last ventral segment of the abdomen is impressed with a central line or fovea, and is truncate and slightly bisinuate at apex, which is furnished with distinct cilia. L. $7-10\frac{1}{2}$ mm.

On *Tanacetum vulgare*, *Mentha aquatica*, &c.; very local, but common where it occurs; Westerham, Kent; Dover; Folkestone; Wicken Fen; Selby Oak and Edgbaston, near Birmingham; Burton-on-Trent and Bretby Park and Wood, near Repton; Stephens also records it from Bath, Bristol, Norfolk, and Cumberland; *C. fulgida* and *C. graminis* are recorded in Murray's catalogue from the Clyde and Tay districts of Scotland, but Dr. Sharp is of opinion that these records perhaps refer to *C. menthrasti*.

C. fastuosa, Scop. Oblong oval, rather depressed, of a bright golden-green colour, with the thorax, the suture of elytra more or less broadly, and a longitudinal band on each elytron blue or violaceous; sometimes the thorax and elytra are more or less coppery, and the suture and bands are bright green; the colour, however, is variable; antennæ dark, more or less metallic, with the first four or five joints almost entirely reddish-testaceous; thorax with the sides almost parallel, slightly rounded and narrowed in front, disc diffusely, sides more strongly, punctured; elytra at base a little broader than thorax, moderately strongly punctured, with the punctures more regular at suture and sides; legs metallic, tarsi with the last joint produced on each side into a tooth at apex. L. $4\frac{1}{2}-6$ mm.

Male with the tarsi slightly dilated, and the last ventral segment of abdomen subtruncate at apex.

On Labiatae, especially *Galeopsis tetrahit* and *G. ladanum*, also by beating white-thorn hedges, and sweeping in grassy places; local; London district, not common, Darenth Wood, Richmond Park, Ripley; Deal; Dover; Hastings; Snowdon district; Wisbech; Walsall; Lichfield; Knoll Hills, Repton; Kersall, near Manchester; Carlisle; Northumberland and Durham district; Scotland, not common, but probably generally distributed, as it has been found in the Solway and Dee districts, and also in the Hebrides and the Orkney Islands.

C. cerealis, L. A very beautiful and conspicuous species; oblong oval or elliptic, convex, upper surface of a brilliant fiery red or coppery colour, with three bands on the thorax and the suture and two or three bands on each elytron purple, finely edged with golden green; the vertex and front of head is also purple or greenish; under-side dark violaceous; antennæ dark, with base usually pitchy; thorax with sides almost parallel, slightly raised, distinctly, but finely, punctured; elytra moderately strongly and thickly punctured, with an intermixture of very fine punctures; legs dark, usually violaceous; the colour is very variable in

continental specimens, but most of the British specimens appear to belong to the ordinary form, except that some are much duller and less brightly coloured. L. 6–9 mm.

On thyme; very local; Snowdon and the immediately surrounding district; it has lately been taken in the locality in some numbers by Dr. J. W. Ellis.

C. didymata, Scriba (*geminata*, Steph., nec Payk.). Oval, convex, coppery, greenish, or bluish, elytra usually coppery; antennæ pitchy, with the basal joints reddish-yellow beneath, metallic above; thorax gradually narrowed and rounded from base to apex, finely punctured on disc, coarsely at sides, with a longitudinal impression at base near posterior angles; elytra finely but distinctly punctured and more or less alutaceous, with nine rows of larger punctures on each, which are arranged in more or less distinct pairs; legs dark. L. 6–7 mm.

Male with the last ventral segment of abdomen slightly convex, transversely flattened behind, and truncate at apex.

In grassy places; local, and, as a rule, not very common; London district, rare, Darenth, Esher, Merstham; Dover; Hastings; Portsmouth district; Glanvilles Wootton; Bristol; Swansea; Dean Forest; Bewdley Forest; Repton, Bretby Wood and Robins Wood; Marple; York; Scarborough, on *Senecio Jacobæa* (Lawson); Northumberland and Durham district; Stephens records it from Forfarshire, but it is not included in Dr. Sharp's Scotch list.

C. hyperici, Forst. (*fucata*, F.). Long-elliptical, moderately convex, coppery, greenish, or bluish, male rather shining, female dull; antennæ pitchy, usually lighter at base; thorax with a strong longitudinal impression at posterior angles, impunctate in front, very finely punctured at base; elytra very finely punctured and alutaceous, with series of large and coarse punctures arranged in pairs, the punctures being situated at irregular distances from one another; legs dark. L. 6–7 mm.

Male with the tarsi moderately dilated, and the last ventral segment slightly convex and transversely impressed in front and behind.

On *Hypericum perforatum* and other species belonging to the same genus; local, but not uncommon; Sheerness, Darenth Wood, Shirley, Mickleham, Reigate, Caterham, Rusper, Boundstone, West Wickham, Headley Lane; Hastings; Holm Bush, Brighton; Portsmouth district; Southampton; Glanvilles Wootton; Bewdley Forest; Manchester and Liverpool districts; Scarborough; Northumberland and Durham district; Scotland, rare, Solway, Tweed, and Clyde districts, Isle of Arran, &c.

Two specimens of *C. violacea*, Goeze (*cærulans*, Scriba), have been recorded as British, one from Lincolnshire, and one from near Windsor (the latter is in the collection of the late Mr. W. Garneys, and the former in the British Museum collection); the species, however, is evidently not indigenous; it appears to be chiefly found on the Continent near mountain streams.

MELASOMA, Stephens. (*Lina*, Redt.)

This genus contains about thirty species, which are widely distributed,

representatives occurring in Europe, Asia, North, Central and South America, and Africa; eight or nine species are found in Europe, most of which are also inhabitants of Asia; three of these occur in Britain; they much resemble *Chrysomela*, from which they may be distinguished by the small mentum, the parallel episterna of the metathorax, and the strongly bilobed third joint of the tarsi, as well as by having the thorax considerably narrower than the elytra; the upper surface is, in part at least, metallic, and the elytra are not punctured in rows; the tibiae have their external margin flattened as far as to the knees; the claws are simple.

The larva and pupa of *Melasoma populi* are described and figured by Westwood (Classification, vol. i., p. 388, fig. 48, 9, 17); the larva is oblong-ovate, of a dirty greenish-white colour, with numerous black scaly spots; the meso- and metathorax are furnished with two large lateral conical tubercles, and the abdominal segments have also two rows of smaller dorsal and lateral tubercles, from which the insect when alarmed exudes a fetid whitish fluid which has somewhat the odour of bitter almonds; the pupa is broad at one end, and narrowed where it attaches itself to the leaf to which it is fastened, and it has the last skin of the larva attached to its extremity; in colour it resembles the larva; I have found the larvæ and pupæ of *M. longicolle*, which much resemble that of *M. populi*, in Langworth Wood, Lincoln, in July, on low aspens.

- I. Upper surface unicolorous, golden green; thorax with the side margin not or scarcely raised *M. æNEUM*, L.
- II. Elytra brownish-red, thorax bluish-black or greenish, metallic, with the side margin strongly raised.
 - i. Size larger and broader; elytra with a small black spot at sutural apical angle *M. POPULI*, L.
 - ii. Size smaller and narrower; elytra without black spot at apex *M. LONGICOLLE*, Suffr.

***M. æneum*, L.** (s.g. *Linæidea*, Mots.). Oblong oval, not very convex, narrowed in front and widened behind, very shiny, upper surface bright green or golden green, sometimes coppery, under-side darker, blackish-green, apex of abdomen ferruginous; head depressed in middle, antennæ short, dark with first joint metallic and joints 3–5 reddish beneath, at all events at apex; thorax very transverse, much narrower than elytra, with the sides not or scarcely raised, diffusely punctured on disc, more closely at sides; elytra closely and rather strongly punctured, considerably widened behind, with the shoulders strongly marked and callose; legs dark, more or less metallic, last joint of tarsi produced into a tooth at each side at apex. L. $5\frac{1}{2}$ –7 mm.

Male with the thorax smaller than in female, and the fifth ventral segment of abdomen subtruncate at apex.

On alders; very local; Exeter; Leicester; Cannock Chase; Bala and Barmouth, Wales; Burnt Wood, Staffordshire; Robins Wood, near Repton, common on alders in June; Chatsworth; Durham; Scotland, local, Solway, Tweed, and Tay districts.

***M. populi*, L.** A large and broad oval and convex species, with the elytra raised before middle and depressed to base, blackish-blue or greenish, metallic, with the elytra red, apex narrowly black at suture;

antennæ, legs and scutellum black, slightly metallic; head depressed on vertex, antennæ short, thickened towards apex; thorax much narrower than elytra, small, strongly emarginate in front with the anterior angles obtusely projecting, disc very finely punctured, almost smooth, sometimes with traces of a central channel, sides broadly raised, coarsely punctured; elytra ample, less shining than thorax, closely, irregularly and not strongly punctured, with shoulders slightly callose; the thorax is usually greenish, but sometimes bluish or even black. L. 9–11 mm.

Male with the tarsi moderately dilated, and the last ventral segment short.

On young poplars and willows; local, but not uncommon where it occurs; Mickleham, Wimbledon, Caterham, Woking; Folkestone; Dover; Hastings; Glanvilles Wootton; New Forest; Swansea; Ely; Cambridge; Wicken Fen; Whittlesea; York; Scotland, rare, Tweed and Forth districts.

M. longicolle, Suffr. (*tremulæ*, Steph.). Very like the preceding in colour and general appearance, but smaller and much narrower and more oblong, with the thorax longer and its disc finely but evidently punctured, and the lateral fold caused by the raised margin deeper; the head is scarcely channelled, and the elytra are more strongly punctured and have no black spot at apex near suture; the last joint of the tarsi also, which is simple in *M. populi*, is produced into a tooth on each side at apex as in *æneum*; in the male the last ventral segment is short. L. $7\frac{1}{2}$ –9 mm.

On willows and aspens, in woods; very local; Blackheath, Darenth Wood, Caterham, Highgate, Farnham, Colney Hatch, Muswell Hill, &c.; Dover; St. Leonards; New Forest; Swansea; Cambridge; Monks Wood; Knowle; Edgbaston; Trench Woods; St. Osyth, Colchester; Langworth Wood, Lincoln, common in July; I know of no locality further north.

Weise (l.c., p. 564) regards *M. longicolle* as a synonym of *M. tremulæ*, and adds "var. a. *elytris apice suturæ puncto infuscato*;" this variety has usually been regarded as the true *M. tremulæ*, which has been sometimes included in the British lists; it appears, however, to differ so little from *M. longicolle* that Weise is probably right in regarding the two species as identical.

PHYTODECTA, Kirby. (*Gonioctena*, Redt.)

The species belonging to this genus may be known by having the claws armed with a sharp dentiform appendage reaching beyond middle, and the tibiæ produced externally in a sharp tooth at apex; they are of oval form and not metallic, with the thorax transverse and the elytra punctured in rows; the first and third joints of the tarsi are broader than the second; the males are smaller and more parallel than the females, and have the tarsi broader; the larvæ are elongate, rather dull, and moderately convex, of a brownish-black colour (as in *G. viminalis*), or brownish or yellowish; each segment, except that of the prothorax, is divided into two equal parts by a well-marked transverse furrow, and

each half is furnished with from six to eight small prominences terminating in a seta directed backwards; these appear sometimes to be more or less confluent; the stigmata are small and black.

About thirty species are contained in the genus, which are chiefly confined to the colder portions of the Northern Hemisphere; only two or three, however, have been found in North America; fourteen species inhabit Europe, of which five have been recognized as British, but one of these, *P. affinis*, requires further confirmation; they may be separated as follows:—

- I. All the tibiæ strongly produced into a tooth at apex; thorax with a setose fovea at the posterior angles; elytra with fine rows of punctures. (*Phytodecta*, i. sp.)
 - i. Legs red *P. RUFIPES*, De G.
 - ii. Legs black *P. VIMINALIS*, L.
- II. Anterior tibiæ not, or scarcely, produced into a tooth at apex; thorax with a setose fovea at all the angles; elytra with coarse rows of punctures (s.g. *Spartophila*, Chev.).
 - i. Disc of thorax finely punctured; form shorter, ovate; size smaller *P. OLIVACEA*, Forst. (*litura*, F.)
 - ii. Disc of thorax coarsely and unevenly punctured; form longer, oblong-oval; size larger *P. PALLIDA*, L.

P. rufipes, De G. (*fulvipes*, Duft.). Oval, convex, shining, upper surface red, with the hinder part of head, a bilobed or trilobed, sometimes oblong, spot at base of thorax, the scutellum and five spots on each (which are variable and sometimes partly absent), black; head diffusely and rather strongly punctured; antennæ red with apex pitchy, short and somewhat thickened towards apex; thorax very transverse with sides slightly rounded, almost smooth on disc, coarsely punctured at sides, anterior angles acutely produced; elytra with very regular fine rows of punctures, interstices finely punctured; under-side black; legs red, femora often more or less infusate. L. $5\frac{1}{2}$ – $6\frac{1}{2}$ mm.

A variety occurs in which the two hinder black spots on the elytra are wanting; this is the *C. sexpunctata* of Fabricius.

On hazels, aspens, willows, &c., in woods; local, but not uncommon where it occurs; London district, Darenth Wood, West Wickham, Claygate, &c.; Brandon, Suffolk; Lords Wood, Southampton; Knowle, near Birmingham; Bewdley Forest; Burnt Wood, Staffordshire; Bretby Wood, near Repton; Langworth Wood, Lincoln; Cumberland; Scotland, very rare, Solway district, "Raehills, Rev. W. Little," Murray's Cat.

P. viminalis, L. Very like the preceding, but easily distinguished by having the head and legs entirely black, and the sculpture of the elytra evidently less fine; the anterior angles of the thorax are more obtusely produced, and the sides are less rounded, and the black spot at the base is, as a rule, less divided; the spots on the elytra are very variable; in the European catalogue there are eight named varieties mentioned. L. $5\frac{1}{2}$ –7 mm.

On willows and salallows; local; London district, rather common, Woking, Haslemere, Darenth, West Wickham and Coombe Woods, Epping Forest; Farnham; Monks Wood; Brandon; New Forest; Lords Wood, Southampton; Bewdley Forest; Burnt Wood, Staffordshire; Yorkshire; Durham; it is not included in Dr. Sharp's Scotch list, but the *G. 10-punctata*, one of the vars. of *G. viminalis*, is recorded by Stephens from "Raehills," Rev. W. Little.

P. olivacea, Forst. (s.g. *Spartophila*, Chevr.). Oval, very convex, rather shining, rufo-testaceous, upper surface finely alutaceous, breast and abdomen dark, often blackish; head thickly and rather strongly punctured, antennæ moderately long, infusate towards apex; thorax rather finely punctured on disc, coarsely at sides, very transverse, with the sides very slightly rounded; elytra with strong and deep rows of large punctures, interstices scarcely punctured; the ordinary colour is testaceous with the suture dark, but is variable; legs rather stout, anterior tibiæ with the external tooth at apex very short and blunt. L. $3\frac{1}{2}$ – $4\frac{1}{2}$ mm.

Male with the last joint of the maxillary palpi broad and securiform.

There are three well-marked varieties of this insect which require noticing:—

V. flavicans, F., entirely rufo-testaceous or yellowish-red.

V. litura, F., rufo-testaceous, with two spots on forehead, the suture of elytra and a longitudinal band on each, and the breast and abdomen black.

V. nigricans, Weise, colour entirely black, or with the mouth parts, base of antennæ, forehead and legs rufescent.

On the broom (*Spartium scoparium*); locally common; London district, common and generally distributed; Hastings; Portsmouth district; Isle of Wight; Glandville's Wootton (on dyers' woad); Devon; Swansea; Barmouth; Knowle, near Birmingham; Bewdley Forest; Stenson, near Repton; Manchester, general; Northumberland and Durham district; Scotland, abundant, Solway, Tay, Dee, Moray, and probably other districts; the black variety is uncommon, and occurs rarely with the type in Scotland and one or two other localities.

P. pallida, L. (s.g. *Spartophila*, Chevr.; *Goniomena*, Mots.). Oblong-oval, convex, rufo-testaceous, rather shining, somewhat resembling the preceding species, but considerably larger; the antennæ are entirely testaceous, and the thorax is more diffusely and much more coarsely punctured on disc; the rows of punctures on the elytra are also stronger, and the interstices are diffusely and very finely, but usually evidently punctured; the apex of the elytra is slightly produced at suture; the anterior tibiæ are simple and not denticulate externally at apex. L. 5–7 mm.

On willow, hazel, mountain ash, &c.; local; London district, not common, Mickleham, Caterham, Coombe Wood, Reigate, West Wickham, Tilgate Forest; Folkestone; Malvern; Brethby Wood, near Burton-on-Trent (taken in numbers on willows by Mr. E. Brown, but I never found it in the locality); Church Stretton; Halifax; Ripon; Scarborough; Arnecliffe in Wharfedale; Northumberland and Durham district;

Scotland, local, Solway, Tweed, Forth, Dee, and Moray districts. Varieties occur on the Continent, more especially in Norway and Sweden and Finland, with the thorax and elytra marked with black spots; I have not seen any of these varieties among our British specimens.

(*P. affinis*, Gyll. This species is extremely doubtful as British, and requires further confirmation before it can be admitted into our lists; one specimen only was found more than twenty years ago by Mr. C. O. Waterhouse among some beetles belonging to Mr. Cocking of Norfolk, who had found it among some sweepings belonging to Mr. Winter; the latter gentleman did not remember its capture, but had no doubt that he had taken it himself with *Leptura sanguinolenta* (also in Mr. Cocking's box) in the Norfolk fens. *P. affinis* resembles the var. *decempunctata* of *P. viminalis*, but may be distinguished by its black thorax, which is also less contracted in front, and by the interstices of the elytra being destitute of punctures. There appears to be a variety with the tibiae and sides of thorax reddish. (See Ent. Monthly Mag. i. 278.)

GASTROIDEA, Hope. (*Gastrophysa*, Redt.)

This genus contains about fourteen species, which are found in Northern and Central Asia, North America, and Europe; of the three European species two occur in Britain; they are small brightly coloured species with the thorax almost straight at apex and margined at base; the antennae have the last six joints thickened; the elytra are closely and irregularly punctured, and the tibiae are strongly produced into a tooth externally at apex; the tarsal claws are simple; the larvae appear much to resemble those of *Melasoma* in general form. The abdomen of the impregnated female swells to a large size, and often far exceeds the elytra; hence the names given to the genus.

- | | |
|--|---|
| I. Thorax green, unicolorous with elytra | G. VIRIDULA, De G.
(<i>raphani</i> , Herbst.) |
| II. Thorax red | G. POLYGONI, L. |

G. viridula, De G. (*raphani*, Herbst.; *polygoni*, var. *b.*, L.). Oval, convex, shining, upper surface golden-green, under-side blackish-blue or blackish-green, antennae and legs dark, more or less metallic; head rather strongly punctured, antennae long, third joint half as long again as those contiguous to it; thorax transverse, narrowed in front, moderately strongly punctured; scutellum almost semicircular; elytra irregularly, closely, and rather strongly punctured; legs rather long, with the first joint of the tarsi dilated in the male. L. $3\frac{1}{2}$ –5 mm.

On *Rumex*, &c.; somewhat local, but widely distributed throughout the kingdom as far north as the Orkney Islands, and sometimes occurring in vast numbers; in some districts it is not very common.

G. polygoni, L. Oval, convex, of a greenish or bluish metallic colour, with the thorax, anal segment of abdomen, and legs except tarsi,

which are more or less infusate, red ; antennæ dark with red base ; forehead with an indistinct central furrow ; thorax double as broad as long, slightly narrowed in front, distinctly punctured ; scutellum sub-triangular ; elytra thickly and irregularly and rather strongly punctured with traces of rows of punctures ; in the males the tarsi are somewhat broader than in the females. L. $3\frac{1}{2}$ –5 mm.

On *Polygonum aviculare* and species of *Rumex* ; common and generally distributed throughout the kingdom ; both this and the preceding species are widely distributed over Europe and Northern Asia as far as North America, where *G. polygoni* has been described as *G. cœruleipennis*, Say.

PLAGIODERA, Redtenbacher.

This genus contains about eighty species, which are very widely distributed, the majority occurring in hot climates, especially in Central and South America ; representatives are found, however, in Asia, Africa, the Australian region, &c. ; there is only one European species, which occurs very locally in Britain ; in size and general appearance it much resembles a *Phædon*, but differs from that genus in being flatter, with the antennæ shorter, and the elytra not punctured in rows ; the first ventral segment of the abdomen is also distinctly shorter, and the epipleuræ are strongly inflexed and, as it were, flattened along the under surface of the elytra, instead of being almost level as in *Phædon*.

P. versicolora, Laich. (*armoraciæ*, F. ; *salicis*, Panz. ; *clavicornis*, Steph.). Oval, rather depressed, upper surface blue or bluish-green, metallic, under-side black or greenish-black ; head very finely punctured, antennæ short, dark with the first five or six joints reddish ; thorax very transverse, narrowed in front, margined, diffusely and finely punctured ; elytra much broader than thorax, irregularly and rather strongly punctured ; legs black, tarsi dark brown or reddish. L. 3–4 mm.

On willows ; occasionally on birches ; very local, but sometimes not uncommon where it is found ; Surbiton, Weybridge, Battersea Fields, &c. ; Prittlewell, Essex ; Colchester ; Weston, Oxfordshire ; Powderham and Exmouth, Devon ; Swansea ; Salford Priors ; Bewdley Forest ; Stourport ; it does not appear to occur further north than the south-midland districts.

This species appears to be of longer form than the exotic species.

PHÆDON, Latreille.

This genus contains about forty species, which are very widely distributed in North, Central and South America, Northern Asia, North Africa, &c. ; eight species occur in Europe, of which four are found in Britain ; the form is short oval and convex, with the thorax strongly narrowed in front ; the elytra are punctured in distinct rows, and the tibiæ are not produced into a tooth at apex ; the larvæ of this and some of the allied genera appear to feed in society upon leaves, preserving, as observed by Westwood (Classification, i. p. 389), one or two most orderly

rows ; some of the members of this group, both in the larval and the perfect state, appear to be very destructive to Cruciferæ, and sometimes do damage to mustard crops ; the precautions to be observed against them are much the same as must be used in the case of the Turnip Fly (*Haltica nemorum*, &c.), which will be discussed further on in this work ; in general structure the larvæ of *Phædon*, *Phratora*, *Prasocuris*, &c., appear to bear a strong analogy to those of *Melasoma*, although they differ somewhat in breadth, convexity, and one or two other minor points.

- I. Thorax with disc impunctate *P. TUMIDULUS*, Germ.
- II. Thorax with disc distinctly punctured.
 - i. Shoulders of elytra very strongly callose ; raised line between intermediate coxæ stronger and quite straight *P. ARMORACIÆ*, L. (*betulæ*, Küst.)
 - ii. Shoulders of elytra moderately callose ; raised line between intermediate coxæ finer and curved.
 - 1. Interstices of elytra extremely finely punctured ; colour, as a rule, bright blue *P. COCHLEARIÆ*, F.
 - 2. Interstices of elytra finely but distinctly punctured and rugose ; colour, as a rule, bright green or golden green *P. CONCINNUS*, Steph.

P. tumidulus, Germ. Short oval, very convex, deep steel-blue, or slightly brassy, sometimes almost black ; head closely and rather strongly punctured, antennæ dark, with base pitchy ; thorax with sides narrowed in front, very smooth, and somewhat flattened, on disc, with base and sides finely punctured ; scutellum large, smooth ; elytra with very fine punctured striæ, interstices extremely finely punctured ; legs dark. L. $2\frac{1}{2}$ –3 mm.

By sweeping herbage, especially by the sides of roads, lanes, &c. ; common and generally distributed throughout the greater part of the kingdom ; Dr. Sharp records it as common in Scotland on *Heracleum spondylium*, and I have found it in numbers on the same plant, but cannot say whether it is attached to it exclusively.

P. armoraciæ, L. (*betulæ*, Küst. ; *cochleariæ*, Panz. et Gyll., nec F.). Short oval, rather convex, shining, of a deep steel-blue cyaneous colour, with the anal segment of abdomen furnished with a broad and bright reddish-testaceous border, a point that will at once distinguish it ; antennæ black ; thorax thickly, distinctly, and uniformly punctured, narrowed in front ; elytra with a strong humeral callosity, and with rather fine punctured striæ, which are, however, much stronger than in *P. tumidulus*, and are somewhat variable ; these striæ are confused at apex ; the interstices are closely and distinctly punctured, but more finely in some specimens than in others ; legs dark. L. 3– $3\frac{1}{2}$ mm.

In damp places, by sweeping herbage, at roots of grass, in flood refuse, &c. ; generally distributed throughout England, and in some localities very common ; in some districts, however, it is certainly not common, and Bold records it as very rare in Northumberland and Durham ; Scotland, local, in the water among *Montia fontana*, Solway, Forth, and Moray districts (Sharp) ; Ireland, Armagh, and probably widely distributed.

In Dr. Power's collection there is a doubtful specimen of *Phædon*, which must be apparently referred to this species; it has the elytra, however, much more strongly punctured, and the punctuation of the thorax also stronger and less even; *P. betulæ*, however, varies in this respect in different specimens, and I think Dr. Power's specimen is an extreme variety; it may, however, prove to be a new species, but in any case requires further confirmation, as it does not appear to agree with any described European species.

This species must not be confounded with *Plagioderma armoraciæ*, the *Chrysomela armoraciæ* of Linné and Fabricius; the nomenclature of this and the following species has given rise to much confusion, as the names *betulæ* and *cochleariæ* have been applied to both; Linné's *Ch. betulæ*, however, which was by Stephens and others supposed to be identical with this species, is in reality *Phyllodecta* (*Phratora*) *vulgatissima*.

P. cochleariæ, F., nec Panz. (*lævigatus*, Duft.; *neglectus*, Sahlb.). Very like the preceding, but smaller and narrower, and of a brighter blue colour, sometimes with a strong greenish reflection; the thorax is less closely punctured on disc than at sides, and the elytra have the humeral callosity very much less pronounced, and in many specimens almost obsolete; the punctured striæ of the elytra are moderately strong, and the interstices are extremely finely punctured; the anal segment of the abdomen is only testaceous at the sides. L. $2\frac{1}{2}$ – $3\frac{1}{2}$ mm.

On Cruciferae; also in marshy places at roots of grass, in moss, &c.; common and generally distributed throughout the greater part of the kingdom.

P. concinnus, Steph. Very closely allied to the preceding, as a rule, of a bright green or golden green colour, but sometimes coppery, golden or greenish purple or blue; it may be distinguished from the foregoing species by having the upper surface more shining and the interstices of the elytra finely but evidently punctured and more or less rugose, and the striæ less regular, the inner ones being finer and less distinct; the humeral callosity is a little more pronounced, but this is not a very evident character; the antennæ, which have the apex of the scape, as a rule, more or less ferruginous in *P. cochleariæ*, are, in this species, entirely black. L. $2\frac{1}{2}$ – $3\frac{1}{2}$ mm.

Salt marshes; at roots of grass, in flood refuse, &c.; very local; rare in England; Gravesend (Marsh); Chatham (Walker); Southend (Stephens); Portsmouth district; recorded from Stoke Wood, Devon, in Parfitt's catalogue; Lancaster, in a marsh (Chappell); Scotland, locally abundant in salt marshes on a cruciferous plant, Solway and Clyde districts; Mr. W. Lennon has sent it to me in plenty from a salt marsh near Dumfries.

PHYLLODECTA, Kirby. (*Phratora*, Chevrolat.)

This genus contains about twenty-five species, which are found chiefly in Northern Asia and Europe; one or two have occurred in Syria and

North America; they are oblong, parallel-sided insects, of a bright metallic (usually blue or bronze) colour, with the antennæ rather long and gradually thickened towards apex, the elytra with more or less regular punctured striæ, and the shoulders moderately callose; the tibiæ are not produced into a tooth at apex, and the tarsi have the third joint broad and bifid, and the claws armed beneath with a sharp tooth; the larva of *P. vitellinæ* somewhat resembles that of *Melasoma populi*; it is of a dirty yellow colour, with the head and legs and large spots, which cover the greater part of the body, dark brown; the method in which these larvæ feed in regular rows upon leaves is figured by Westwood (Classification, i. p. 387, fig. 48, 18); eight species belonging to the genus are found in Europe, of which three occur in Britain; these may be distinguished as follows:—

- I. Punctured striæ of elytra irregular, colour blue . . . *P. VULGATISSIMA*, L.
- II. Punctured striæ of elytra regular.
 - i. Forehead broadly excavated; antennæ longer; colour dark blue *P. CAVIFRONS*, Thoms.
 - ii. Forehead with a slight depression, not excavated; antennæ shorter; colour, as a rule, bronze *P. VITELLINÆ*, L.

***P. vulgatissima*, L. (*betulæ*, L).** Oblong, subparallel, rather depressed, of a metallic blue or greenish blue colour, shining, with the middle of the metasternum and the first abdominal segment brassy, often coppery; head rather thickly and finely punctured, clypeus broad, antennæ slender; thorax broader than long, with the sides almost parallel, narrowed in front, diffusely punctured on disc, more closely at sides; elytra evidently broader than thorax, with irregular punctured striæ on disc, confusedly punctured at sides; legs moderately long, dark, more or less metallic. L. $3\frac{1}{2}$ –5 mm.

Male with the posterior tibiæ slightly curved, and the first joint of the tarsi strongly dilated, and a little broader than the third joint.

On poplars, willows, &c.; also under bark in winter; common and generally distributed throughout the greater part of the kingdom.

***P. cavifrons*, Thoms. (*laticollis*, Suffr., *teste* Weise).** More convex than the preceding, from which it may be at once known by the regular rows of punctures on the elytra, and the deeply hollowed forehead; in general form and sculpture it more closely resembles *P. vitellinæ*, from which it may be separated by its deep blue colour, excavated forehead, longer and stouter antennæ, longer and less transverse thorax, and the structure of the tarsi, which in the male have the first joint moderately dilated, much narrower than the third joint, and in the female have the first two joints small and narrow, and the third joint very broad. L. $3\frac{1}{2}$ – $4\frac{1}{2}$ mm.

On *Populus nigra* and *P. tremulæ*; also found beneath the bark in winter; local; Darenth Wood, Caterham, Mickleham, Dulwich, Esher, Aylsham; Hastings; Burnham, Somerset; Midland districts, generally distributed; Lincoln; Scotland, very rare, Moray district, "Strathglass, Buchanan, White."

P. vitellinæ, L. Oblong-oval, a little less parallel than either of the two preceding species, of a bronze or greenish-bronze colour, sometimes with the elytra coppery, and rarely entirely black; the regular striæ on the elytra will at once separate it from *P. vitellinæ*, and from *P. cavifrons* it may be known by the characters given above; in the male the first joint of the tarsi is only a little narrower than the third joint. L. $3\frac{1}{2}$ – $4\frac{1}{2}$ mm.

On willows, hazels, poplars, &c.; often found in great numbers under bark in winter; very abundant throughout the kingdom.

HYDROTHASSA, Thomson.

The species belonging to this and the succeeding genus have been by many authors included together under *Prasocuris*, Latreille; they appear, however, to be quite distinct; in the present genus the form is oval or oblong-oval with the under-side almost without pubescence; the thorax is transverse and not margined at base; the elytra are furnished with eight punctured striæ, and have an irregular accessory series near sides, and the prosternum is not broad between the coxæ, and has the process margined; the two genera together contain fifteen species, which are found in Europe, Algeria, South Africa, and North America; three of the six European species occur in Britain.

I. Thorax unicolorous, without reddish-yellow side border. H. **AUCTA, F.**

II. Thorax with broad reddish-yellow side border.

i. Form oblong; elytra without longitudinal yellow bands on disc H. **MARGINELLA, L.**

ii. Form ovate; elytra with a longitudinal yellow band on disc of each, joining the yellow side border at apex H. **HANNOVERANA, F.**

H. aucta, F. Short oblong oval, convex, of a deep bronze-green or bluish colour, sometimes almost black, elytra with the sides broadly reddish-yellow; head and thorax closely and distinctly punctured, antennæ moderately long, black; elytra with rather strong punctured striæ, interstices very finely punctured; prosternal process strongly margined; legs black, rather stout. L. $2\frac{1}{2}$ –4 mm.

Male with the anterior tibiæ slightly curved, and the first joint of the tarsi moderately dilated.

Damp places by sweeping herbage; somewhat local, but generally distributed throughout England; it does not appear, however, to be common in the midland counties; Scotland, Solway, Tweed, Forth, Clyde, and Dee districts; Ireland, Dublin, &c.

H. marginella, L. Very like the preceding, but of slightly narrower and longer form, and less convex; it may at once be known by the broad reddish-yellow side margins of thorax; the punctuation of the head and thorax is evidently more diffuse, and the latter is much less transverse, and not much broader than long; the prosternal process is feebly margined. L. 3–4 mm.

Male with the tibiæ dilated towards apex, the anterior slightly, and the posterior very slightly, curved, and the tarsi moderately dilated.

Female with a longitudinal raised fold at shoulders of elytra.

Banks of rivers and marshy places, at roots of plants and grass, in flood refuse, &c.; often found in abundance in spring in Ranunculaceæ; common and generally distributed throughout the greater part of England, but somewhat local in some districts; Scotland, Solway and probably several other districts; Ireland, Dublin, Armagh, Belfast, and most likely general.

In both this and the preceding species varieties occur rarely in which the reddish-yellow colour of the side margins is very obscure, sometimes almost pitchy, or slightly æneous.

H. hannoverana, F. Ovate, or obovate, rather convex, shining, of a bluish or greenish black or nigro-æneous colour, with the margins of thorax and elytra broadly yellowish-red, and a broad longitudinal band of the same colour on the disc of each elytron, which extends from base to apex, and is curved outwards a little before base; head finely punctured, antennæ black, with the seventh joint slightly produced in a triangular lobe on its upper surface; thorax transverse, narrowed in front, very diffusely punctured, more finely on disc than at sides; elytra with strong punctured striæ, interstices slightly convex and almost smooth; the elytral bands are somewhat variable, being occasionally interrupted; legs black. L. 4-4½ mm.

Male with the tibiæ dilated towards apex, and the anterior pair slightly curved; tarsi moderately dilated.

Female with the fifth and seventh interstices raised and subcostate at base.

In damp meadows on *Caltha palustris* and other Ranunculaceæ in spring; rare; Askham Bryan, near York (Preston); Fulford, near York (Hey); Hampshire (Moncreaff); I do not know of its occurrence in any other locality in Britain; Weise says that it is common in the northern half of Germany, but sparingly distributed in the southern half, and Thomson records it as rather rare in Norway and Sweden.

PRASOCURIS, Latreille. (*Helodes*, Paykull.)

The members of this genus may be easily distinguished by their elongate and narrow form and quadrate or oblong thorax, which is margined at base; the under-side is sparingly pilose; the elytra are furnished with nine punctured striæ, and the prosternum is broad between the coxæ, and has the process not margined; of the five European species two are found in Britain:—

- | | |
|---|---|
| I. Upper surface unicolorous blue | P. JUNCI, Brahm.
(<i>beccabungæ</i> , Ill.) |
| II. Upper surface black-bronze, with the sides of thorax, and
elytra, and a longitudinal band on each of the latter,
yellow | P. PHELLANDRII, L. |

P. junci, Brahm. (*beccabungæ*, Ill.). Elongate, oblong, rather

depressed, subparallel, of a lighter or darker cyaneous blue colour, sometimes dark steel-blue, almost black, with the apical ventral segment of the male narrowly, and of the female more broadly, edged with reddish-testaceous; head rather strongly punctured, antennæ short, black, with the penultimate joints subtransverse, the last five forming an elongate club; thorax subquadrate, rounded in front, distinctly punctured, the punctuation being closer in some specimens than in others; elytra long, broader than thorax, with fine punctured striæ, interstices very finely and closely punctured and alutaceous; legs dark, metallic. L. 4–5 mm.

Male with the tibiæ dilated towards apex and slightly curved; tarsi moderately dilated.

On the brook-lime (*Veronica beccabunga*), at the edges of ponds and streams; generally distributed throughout the kingdom, and, as a rule, common.

P. phellandrii, L. Very like the preceding in general form, but somewhat larger and easily distinguished by its colour, which is black bronze, with the margins of thorax and elytra broadly reddish-yellow, and a broader or narrower reddish-yellow band on the disc of each elytron, which usually reaches from base to apex, but is sometimes interrupted or abbreviated; the tibiæ also, with the exception of the extreme apex and base, are yellow; head thickly and rather strongly punctured; thorax a little longer than broad, quadrate, diffusely and strongly punctured; elytra long, only a little broader at base than thorax, with strong punctured striæ, interstices almost smooth; the male characters are much as in the preceding species. L. $4\frac{1}{2}$ –6 mm.

On the banks of ponds and slowly running streams, on *Phellandrium aquaticum*; common and generally distributed throughout the greater part of the kingdom; it is frequently taken in the water net; the larva is black, and lives in the hollow stems of water plants.

GALERUCINA.

This division is a very extensive one, and falls naturally into two great tribes which contain a large number of species and are largely represented throughout the greater part of the world; as far as the European species are concerned, they are, for the most part, small or obscurely coloured insects compared with the Chrysomelidæ, but in tropical climates many of the genera are very beautiful and conspicuous; both in the larval and perfect state they are entirely herbivorous; in the tropics they are very useful in keeping down redundant vegetation, but in countries where most of the land is brought under cultivation many of them, and these too often the smallest members of the group, are unmitigated pests and cause great loss to the farmer.

The following are the general characters of the division:—Head vertical, with the labrum rather large and the clypeus often bent back behind, as a rule sunk in the thorax as far as the eyes, which are finely granulate and not emarginate; antennæ more or less approximate, inserted on the front between the eyes, or on the lower line of the eyes;

thorax with the sides margined, and the anterior angles, as a rule, somewhat produced; scutellum visible; tarsal claws appendiculate or armed with a tooth, which is very rarely absent.

The two tribes may be separated as follows:—

- I. Posterior femora slender, not formed for leaping; anterior coxæ conically prominent at apex GALERUCÆ.
- II. Posterior femora thickened, formed for leaping; anterior coxæ not conically prominent at apex HALTICÆ.

GALERUCÆ.

According to the Munich catalogue published in 1876, this division, or family as some authors regard it, contains about one hundred genera and eight hundred species; since that time, however, about forty genera and upwards of five hundred species have been added, and the number is being constantly increased by the researches of Mr. Baly, Mr. Jacoby, and others; a large proportion of the additions are due to Mr. Champion, who has shown us, by what he has done in Central America, what vast fields yet remain unexplored, and how much we may expect in the future from other districts of the world, if only equally energetic workers can be found to search them; the *Galerucæ* are represented in Europe by thirteen genera and about one hundred and twenty species, most of which are somewhat obscure and not conspicuous insects; of these only seventeen have hitherto been discovered in Britain; in our catalogues they are usually assigned to only five genera, but I have adopted *Lochmæa*, Weise, and *Sermyla*, Chapuis, as the species belonging to them appear to be distinct from those with which they have been classed.

The larvæ of the *Galerucæ* are more elongate and linear than those of *Chrysomela*; the mouth parts, according to Chapuis (Cat. des Larves des Coléoptères, p. 274), resemble those of *Crioceris*, but the larvæ of the latter insect have six ocelli on each side of the head, whereas those of the present tribe have but one; the bifid process which terminates the anal segment of the abdomen in *Timarcha* and *Chrysomela* is here replaced by a simple and rather larger process; as a rule the larvæ are of a dull colour, sometimes entirely black, and are covered with more or less numerous yellow hairs; the dorsal segments are transversely furrowed and furnished with shining black plates or tubercles as in *Melasoma*; the larvæ bury themselves in the ground before assuming the pupal state.

The larvæ of *Adimonia tanaceti* and *Galeruca nymphaea* are figured by Westwood (Classification, i. p. 377, fig. 46, 21 and 15); the former is black and fleshy, and is less elongate than the latter, and has each segment furnished with several raised setose tubercles placed transversely; the latter has the segments wrinkled, and is only furnished with lateral tubercles; the larva of *Agelastica alni* is also figured (l. c. p. 383, p. 47, fig. 4); it is more elongate than is the case with the generality of the larvæ of this tribe, and according to Bouché it moves along like the caterpillars of the Geometridæ.

- I. Anterior coxal cavities open behind.
 - i. Elytra without epipleuræ PHYLLOBROTICA, Redt.
 - ii. Elytra with the epipleuræ distinct, at least near shoulders.

1. Claws split or sharply toothed.
 - A. Upper surface clothed with thick silky pubescence *GALERUCELLA*, *Crotch.*
(*Galeruca*, auct.)
 - B. Upper surface glabrous or almost glabrous . . . *LOCHMÆA*, *Weise.*
2. Claws with a broad dilatation at base.
 - A. Tibiæ with strong apical spurs; tarsi with first joint about as broad as third *AGELASTICA*, *Redt.*
 - B. Tibiæ with obsolete apical spurs; tarsi with the first and second joints distinctly narrower than third *LUPERUS*, *Geoffroy.*
- II. Anterior coxal cavities closed behind.
 - i. Antennæ with the third joint not shorter than the fourth; last joint of maxillary palpi long, gradually narrowed in front; upper surface not metallic . . . *ADIMONIA*, *Laich.*
(*Galeruca*, Geoff.)
 - ii. Antennæ with the third joint shorter than fourth; last joint of maxillary palpi short and conical; upper surface metallic *SERMYLA*, *Chap.*
(*Agelasa*, Mots.)

AGELASTICA, Redtenbacher.

Two species are recorded in the Munich catalogue as belonging to this genus, one from Europe and the other from Japan, and three more have since been added by Mr. Baly from Australia, Moreton Bay, and Sanju; the species is usually joined in our catalogues with *Sermyla* (*Agelasa*) *halensis*, but the fact that the latter genus has the anterior coxal cavities closed behind, whereas in *Agelastica* they are open, will at once separate them; the single European species is extremely rare in Britain, and has not, as far as I know, been met with for many years; it is the *Adimonia alni* of Stephens, and is figured by him in the Illustrations, Mandibulata, vol. iv. p. xx. fig. 5.

A. alni, L. Oval, rather convex, shining, of a deep violet or bluish-violet colour, with the antennæ, tibiæ and tarsi black, the former with the first two joints metallic; head narrower than thorax, with a central furrow, antennæ rather stout, with the third joint plainly longer than the second, but shorter than the fourth; thorax somewhat convex, broadest behind middle, somewhat narrowed in front, disc thickly punctured, often impressed on each side at or before middle; scutellum smooth, triangular; elytra about as thickly punctured as thorax, but with the punctuation stronger; legs moderately long. L. 6–7 mm.

Male with the fifth ventral segment of the abdomen slightly impressed in a semicircle at apex.

On alders; very rare; Stephens records it from near London, Exeter and Bristol, and says, "I have formerly obtained several specimens from near Exeter, where they were captured in June;" there is no reason why it should be so rare in Britain, as it is far from uncommon on the Continent.

PHYLLOBROTICA, Redtenbacher. (*Auchenia*, Marsham.)

This genus contains about a dozen species, three of which are found

in Europe, and the rest in North America, Northern and Central Asia, and India, the single Indian species being also recorded under another name from Java; they are characterized by having the anterior coxal cavities open behind, the elytra without distinct epipleuræ, and the claws of the tarsi appendiculate (furnished with a broad dilatation at base); the thorax is subrectangular and parallel-sided, and the scutellum is truncate at apex; the legs are rather long. The extensive exotic genus *Diabrotica* is closely allied to *Phyllobrotica*, and differs chiefly in having the claws cleft, and in the presence of distinct epipleuræ; it contains more than two hundred species, which are chiefly confined to Central America and the tropical portions of South America.

P. quadrimaculata, L. Oblong, rather elongate, lighter or darker testaceous or yellow, with the head, except front, the metasternum and abdomen, and two spots on each elytron, black; one of these spots is situated before apex, and is larger than the other which is near the base; head rather large with a distinct central furrow, antennæ long, slightly fuscous towards apex, eyes large; thorax transverse, parallel-sided, almost smooth, considerably narrower than elytra; elytra rather long, depressed on disc, very finely punctured; legs long, testaceous, with the tarsi, and sometimes the femora, more or less infusate. L. 5-7 mm.

Male with the first joint of the tarsi dilated, and the first four ventral segments of the abdomen short, the third and fourth being triangularly impressed; the fifth segment is very large, subtruncate at apex, broadly impressed and longitudinally channelled in the middle.

On *Scutellaria galericulata* (Common Skullcap), and on *Utricularia*; it is also found on alders; local and, as a rule, not common; Woking, Esher, Battersea Fields, Notting Hill, and Hammersmith Marshes (formerly); Dravton; New Forest; Bristol; Crymlyn Bog, Swansea; Monks Wool; Ely; near Burton-on-Trent; on *Utricularia* in Raincliffe Bog, near Scarborough (Lawson); Scotland, Clyde district, found on one or two occasions near Glasgow; Ireland, two specimens taken by the Rev. W. F. Johnson at Coney Island, Lough Neagh; Weise records it as locally common throughout Europe on *Scutellaria galericulata*.

The *v. munda*, Weise, has the subbasal spots of the elytra wanting.

LUPERUS, Geoffroy.

In this genus the anterior coxal cavities are open behind, and the antennæ are long and filiform, in the male usually longer than the body; the thorax is transverse, much narrower than the elytra, and the epipleuræ are narrow and cease behind; the first joint of the tarsi is elongate, longer than the two following together, and narrower than the third joint; the claws are short, and widened into a tooth-like dilatation at base; the genus contains nearly a hundred species, which are chiefly found in the more temperate portions of the Northern Hemisphere, although a few have been described from Brazil, Ceylon, Cuba, &c.; thirty-eight species are found in Europe, of which three occur in Britain.

- I. Second joint of antennæ as long as, or only slightly shorter than third; elytra with sparingly distributed upright hairs on its hinder half (s.g. *Calomicrus*, Steph.) L. NIGROFASCIATUS, Goeze
(*circumfusus*, Marsh.)
- II. Second joint of antennæ much shorter than third; elytra glabrous or almost glabrous.
- i. Thorax black in both sexes. L. RUFIPES, Scop.
- ii. Thorax yellow or reddish-yellow in both sexes L. FLAVIPES, L.

L. nigrofasciatus, Goeze (*circumfusus*, Marsh.; *Spartii*, Koch). Subparallel, not very convex, shining, with the greater part of the elytra and the anterior part of thorax yellow; head together with eyes nearly as broad as thorax, antennæ long, pitchy with testaceous base; thorax transverse with sides slightly rounded, very finely punctured, with the black portion irregular in front; scutellum black; elytra thickly and finely punctured, with suture and sides more or less broadly black; legs long, testaceous, more or less infusate. L. 3-4 mm.

Male with the antennæ rather longer than in the female.

On the gorse, *Ulex Europæus*, also on *Spartium scoparium*, *Genista tinctoria*, and *Calluna vulgaris*; usually in sandy places; local, but not uncommon where it occurs; London district, rather common in some localities, Reigate, Esher, Woking, Ripley (Surrey), Westerham, Boundstone, &c.; Hastings; Brighton; Shirley Warren, Southampton; New Forest; Portsmouth district; Parkhurst Forest and Sandown, Isle of Wight; Bournemouth; Weymouth; Glanvilles Wootton; Devon (on broom); Swansea; there is one Northumberland record, Prestwick Carrs (G. Wailes), in Bold's catalogue, but it is not recorded from any midland or northern locality of England or from Scotland; I have never found it further north than the New Forest.

L. rufipes, Scop. (*longicornis*, F.; *betulinus*, Joann.). Black, shining, with the first four joints of the antennæ and the legs rufo-testaceous, the tarsi and apex of tibiæ being sometimes a little infusate, and the base of the femora being usually dark; head and antennæ variable in the sexes, thorax broadest before middle, sparingly and exceedingly finely punctured, disc almost smooth; elytra confusedly and distinctly punctured; legs moderately long. L. 4-5 mm.

Male narrower and more parallel, with the antennæ longer than the body, and the head broader.

Female broader and more widened behind, with the antennæ shorter and the head narrower.

On birch, willow, alders, &c.; usually in damp places, somewhat local but rather common and generally distributed throughout the greater part of England and Scotland, and probably of Ireland.

L. flavipes, L. Very closely allied to the preceding, but easily distinguished by having the thorax yellow or reddish-yellow in both sexes, and the legs, as a rule, but not always, much more infusate; the thorax is very smooth and shining, scarcely visibly punctured, and the elytra are

a little more finely punctured, and near the suture are obsoletely rugose transversely; in the male the antennæ are very long, much longer than the body, and the general form is narrower than in the female, which has much shorter antennæ; the head also is broader in the male, and the fifth ventral segment of the abdomen is impressed with a fovea in the middle. L. $3\frac{3}{4}$ –5 mm.

On birch, willow, alder, hazel, &c.; somewhat local, but generally distributed throughout the greater part of England; Scotland, common as far north as the Moray district; it probably occurs commonly in Ireland; it is spread over Europe and the northern half of Asia.

LOCHMÆA, Weise.

This genus seems quite distinct from *Adimonia* from the fact that the anterior coxal cavities are open behind, whereas in the latter genus they are closed; from *Galerucella* it may be known by the glabrous upper surface of its members; the intermediate coxæ are contiguous at apex, and the posterior pair are widely distant; the tibiæ are simple and the claws of the tarsi dentate; of the eight European species three are found in Britain; they may be distinguished as follows:—

- I. Thorax produced into a more or less distinct angle in middle of sides; upper surface dirty testaceous, fuscous, or black.
 - i. Head and thorax dull, more closely punctured, frontal tubercles not distinct; colour lighter L. CAPRÆ, L.
 - ii. Head and thorax shining, less closely punctured, frontal tubercles distinct, polished and shining; colour darker, the suture at least being nearly always black L. SUTURALIS, Thoms.
- II. Thorax rounded at sides, and not angled; upper surface sanguineous L. CRATÆGI, Forst.
(sanguinea, F.)

L. capræ, L. Oblong, rather convex, black, with the thorax and elytra yellowish-testaceous or fusco-testaceous, the former being marked with black, and sometimes entirely dark; antennæ at base and the knees, tibiæ, and tarsi usually more or less testaceous; upper surface very scantily pubescent, rather shining; forehead closely and finely and somewhat rugosely punctured behind, with the frontal tubercles not distinct, antennæ moderately long, with the third joint more than twice as long as the second; thorax transverse, angled in middle of sides, with a central furrow and a broad fovea on each side, strongly and coarsely punctured; elytra broader at base than thorax, slightly widened behind, with the shoulders rounded, and with rather strong and almost smooth humeral callosities, rather closely, coarsely, and deeply punctured; legs rather stout. L. 4–5½ mm.

Male with the first joint of the tarsi, especially of the posterior pair, strongly dilated, the posterior tibiæ curved, and the second to the fourth ventral segments of the abdomen pilose in middle.

Female with the fifth ventral segment slightly incised in the middle.

On young willows and salows, especially *Salix caprea*, also on birches; somewhat local, but very widely distributed, and common in the midland districts; the following species appears to take its place further north, the only Scotch record being from the Solway district. Ireland, Dublin and Belfast.

L. suturalis, Thoms. Exceedingly closely allied to the preceding, with which it was regarded as identical until Thomson separated it as a distinct species; it is much darker in colour, and occasionally is entirely black; the elytra are often black or nearly black, and the suture, at all events, is always dark; apart from the difference of colour, however, which is variable in *L. caprea*, it may be known from the latter species by having the forehead more shining, more sparingly but more strongly punctured, and the frontal tubercles distinct and polished; the thorax also is more shining and more scantily punctured at the sides, and in the male the second and third ventral segments of the abdomen are clothed with thicker and longer pilose hairs. L. 4-5½ mm.

On heather; by no means uncommon, and very widely distributed; it has, however, been so much mixed up with the preceding that the records are uncertain; it also occurs on birches and willows (especially, according to Thomson, on *Salix repens*); it is probably common in the Northumberland and Durham district, and the Scotch record is "abundant among heather," Solway, Tweed, Forth, Dee, Moray, and probably other districts; Ireland, Armagh.

L. cratægi, Forst. (*sanguinea*, F.). Oblong, rather short and broad, convex, upper surface sanguineous, under-side black; head closely punctured, antennæ rather short, dark; thorax transverse, with sides rounded and not angled, with a central furrow and a fovea on each side, strongly and coarsely punctured; scutellum pubescent, elytra closely, strongly, and coarsely punctured; legs rather stout. L. 4-5 mm.

Male with the scutellum and the impressions of the thorax black, and the elytra with a patch and an abbreviated band, or two abbreviated bands, also black; legs black, with the tibiæ testaceous at base, and the posterior pair sinuate internally towards base, tarsi with the first joint moderately dilated; fifth ventral segment of abdomen with a broad impressed channel in middle, terminated at base in a small tooth.

Female with the thorax and elytra immaculate, or with the dark markings very obsolete, and with the legs and apex of abdomen red.

On flowers of whitethorn; rather common and generally distributed in the London district and the southern counties; less common further north; Swansea; Cambridgeshire; Hunts; Bishops Wood, Staffordshire; Needwood Forest; Ingleby, near Repton; York; Northumberland district rare; Scotland rare, Tweed district; Ireland, Galway (J. J. Walker) and Armagh (Johnson).

GALERUCELLA, Crotch. (*Galeruca*, auct.)

The name of *Galeruca*, which has been assigned in most of our British catalogues to this genus, ought, apparently, to be assigned to *Adimonia*; as, however, the change would cause considerable confusion, I have still

retained the latter name for *A. tanacetii* and *ælandica*, and have adopted Crotch's name for the present genus (in the Munich catalogue it is regarded as including *Lochmæa*); thus constituted it contains about eighty species, which are very widely distributed, representatives occurring in Siberia, Madagascar, and the Cape of Good Hope, the Australian region, &c., as well as in the intervening districts; ten species of *Galerucella* proper are found in Europe, of which six are inhabitants of Britain; several authors separate *G. viburni* as a distinct genus (*Trirrhabda*, Lec.), on account of the projecting genæ and long and stout mandibles; Thomson includes *Trirrhabda*, *Lochmæa*, and *Galerucella* under one genus, *Galeruca*, while Horn and others, while accepting either one or two of these genera as separate, abolish the name *Galerucella* altogether; the members of the genus *Galerucella*, as here constituted, may be known by having the anterior coxal cavities open behind, the third joint of the antennæ distinctly longer than the fourth, and the body thickly pubescent; the thorax is finely margined at base, and the epipleuræ of the elytra are continued almost or quite to the sutural angle; the legs are glabrous on their external margin, and the claws are bifid, or armed with a small sharp tooth; the colour is usually dull testaceous or yellowish, sometimes fuscous brown or almost black. The British species may be distinguished as follows:—

- I. Head rather long, with projecting genæ and long and stout mandibles; femora comparatively thick, with the anterior pair somewhat more slender than the others (s.g. *Trirrhabda*, Lec.; *Pyrrhalta*, Joann.) *G. VIBURNI*, Payk.
- II. Head short, with narrow genæ and rather short mandibles; femora comparatively slender (*Galerucella*, i. sp.).
 - i. Epipleuræ of elytra ceasing shortly before apex.
 1. Apical edge of elytra sinuate, so that the sutural angle is produced into a short point; intermediate coxæ plainly separated *G. NYMPHÆÆ*, L.
 2. Sutural apical angle of elytra entirely rounded, or scarcely produced; intermediate coxæ almost contiguous.
 - A. Thorax shining, scarcely pubescent *G. SAGITTARIÆ*, Gyll.
(*aquatica*, Fourc.)
 - B. Thorax dull, thickly pubescent *G. LINEOLA*, F.
 - ii. Epipleuræ of elytra continued to apex, with the sutural apical angle produced.
 1. Size larger, thorax thickly pubescent; antennæ darker; elytra, as a rule, with a well-defined longitudinal dark band on each *G. CALMARIENSIS*, L.
 2. Size smaller; thorax scarcely pubescent; antennæ lighter; elytra often obscurely infuscate on disc, but without a well-defined dark band *G. TENELLA*, L.

G. viburni, Payk. Oblong-oval, convex, dull, clothed with very thick golden grey pubescence, very finely punctured, of a fuscous testaceous colour or brownish, with the head, thorax, and a patch near each shoulder lighter, and a spot on the vertex of head, as well as the margins

and central line of thorax, and the scutellum and humeral prominences, blackish; head large, antennæ long, dark; thorax transverse, with the sides angled in the middle; elytra very thickly and finely, almost rugosely punctured, entirely rounded at the apical sutural angle; legs moderately stout, testaceous. L. $4\frac{1}{2}$ – $6\frac{1}{2}$ mm.

Male with the fifth ventral segment of the abdomen deeply impressed in a semicircle.

Female with the fifth ventral segment broadly incised subtriangularly at apex.

On *Viburnum opulus* (the Guelder Rose), and more rarely on *Viburnum lantana* (the Wayfaring-tree); local; London district, not uncommon, Darenth Wood, Lee, Woking, Forest Hill, Mickleham, Rusper; Weston, Oxon; Hastings; Glanvilles Wootton; Swansea; Knowle, near Birmingham; Leicester; Robins Wood, Repton; Scarborough; Northumberland and Durham district; Scotland, Solway district, "Raehills, Rev. W. Little," Murray's Cat.

G. nymphaeæ, L. Oblong, rather depressed, fuscous black or dark brown, with the front of head, the thorax (except two or three dark spots), the border of the elytra and the greater part of the legs rufo-testaceous; head rather large, with a furrow in front, antennæ short and stout, dark with reddish base; thorax angled in middle of sides, with the disc shiny and almost impunctate, with one or two foveæ in centre, and one at each side, the latter being thickly and almost rugosely punctured; elytra subparallel, clothed with fine greyish pubescence, thickly, rather coarsely, and somewhat rugosely punctured, with distinct traces of raised lines, and with the sutural angle of each produced into a short sharp point; under-side clothed with whitish silky pubescence; legs reddish-testaceous, with the base of femora and the tibiæ more or less infusate. L. 6–8 mm.

Male with the fifth ventral segment of abdomen deeply impressed triangularly at apex, and the posterior tibiæ slightly curved.

Female with the fifth ventral segment narrowly but deeply incised at apex.

On aquatic plants, especially species of *Nymphaea* and *Nupar*; local, but not uncommon in many districts; Snodland, Kent; Tooting, Surrey; Aylsham; Pegwell Bay; Deal; Hastings; Arundel; Hants; Glanvilles Wootton; Swansea; Gloucester; Coleshill; Knowle; Cannock Chase; Horning Fen; Cheshire; Scarborough; Northumberland and Durham district, not common; Scotland, Tweed and Forth districts; Ireland, near Dublin and Armagh.

G. sagittari, Gyll. (*aquatica*, Fourc.). Very closely allied to the preceding, and by many authors regarded as merely a variety; it may, however, be known by its colour, which is much lighter, being obscure yellow-testaceous, and by the duller forehead, which is extremely finely punctured, but especially, according to Weise, by having the sutural apical angle of the elytra rounded and not produced; the large foveæ at the sides of thorax are more finely punctured, and the general size is smaller; the colour differences are often misleading in

these species, and specimens that I have been accustomed to regard as type *G. sagittariæ* certainly have the sutural apical angle slightly produced in a point, so that I still feel some doubt as to their distinctness, although ordinary specimens of the two species certainly look quite different. L. 4–5 mm.

Marshy places; on *Lysimachia vulgaris*, *Hydrocharis morsus-ranæ*, *Hypericum quadrangulum*, &c.; also on rushes; local, but not uncommon where it occurs, and distributed much as the preceding species; it appears to be rarer or rather more local in the north of England, and the only Scotch record is Solway district, Dabton Loch, Thornhill, near Dumfries, in numbers (Sharp).

G. lineola, F. Oblong, subparallel, rather depressed, of a dull yellowish-testaceous colour, with the apex of the joints of the antennæ, the vertex of head, the scutellum, the meso- and metasternum, and the abdomen, except apex, black; in general appearance it much resembles the preceding species, from which it may be at once known by its dull and much more closely pubescent thorax, somewhat narrower and more parallel elytra, and by having the apical sutural angle of the elytra without a trace of a prolongation; from the two following species it may be distinguished by its more elongate and parallel-sided elytra, and by the fact that the epipleuræ cease a little before apex of elytra; varieties occur in which the humeral callosity and an obscure black band on each elytron are brownish or blackish, but as a rule the elytra are quite immaculate. L. 4–5 mm.

The sexual characters are much as in the preceding species.

On willows, especially *Salix viminalis*, also on alders and hazels; I used to find it abundantly in osier beds near Repton, Burton-on-Trent; it appears, however, to be more local than several of the other species; Greenhithe; Woking; Brentford; Hastings; Portsmouth district; Glanvilles Wootton; Exeter; Bristol; Swansea; Wicken Fen; Burwell Fen; Cheshire; Ireland, near Waterford (Power), and Armagh (Johnson); the only Scotch record is "Raehills, Rev. W. Little," Murray's Cat., and I feel very doubtful as to the Northumberland specimens, as those at first recorded were shown by Mr. Crotch to be *G. tenella*, and Bold quotes the only ones he appears to know of as synonymous with *G. lythri*, which is apparently synonymous with *G. calvariensis*, L.

G. calvariensis, L., nec F. (*lythri*, Gyll.; *aquatica*, Müll.). Smaller than the preceding species, from which it may be known by having the epipleuræ of the elytra continued to apex, and the sutural apical angles mucronate; the punctuation of the elytra also is much coarser; from *G. tenella* it may be distinguished by its larger size, more closely pubescent thorax and darker antennæ, and also by the deeper punctuation of the elytra; the usual colour is testaceous yellow, with the vertex, central line of thorax, scutellum, a well-marked longitudinal band on each elytron, and the breast and abdomen (except apex) black; the antennæ are dark with the base red; the colour, however, is variable, the elytral bands being sometimes wanting, in which case, however, the humeral callosities usually remain dark; the thorax is

angled in the middle of sides, and has a deep depression on each side of disc, and the elytra are thickly set with deep subocellate punctures. L. $3-4\frac{1}{2}$ mm.

Male with the fifth ventral segment of abdomen deeply and broadly excised triangularly at apex.

Female with the fifth ventral segment narrowly incised at apex.

Marshy places; on *Lythrum salicaria*, &c.; local, but not uncommon where it occurs; Woking; Maidstone; Bearsted; Horsell; Brentford; Dover; Hastings; Portsmouth district; New Forest; Glanvilles Wootton; Barnstaple; Exminster; Bristol; Swansea; Barmouth; Hunts; Wicken Fen; Redgrave Fen; Mabberley, Cheshire; Northumberland and Durham district, rare, Hetton Hall, near Belford; Scotland, "Raehills, Rev. W. Little," Murray's Cat.; Ireland, Armagh, Johnson.

The *G. calvariensis* of Fabricius is the *G. xanthomelæna* of Schrank and the European catalogue.

G. tenella, L. Considerably smaller, on an average, than ordinary specimens of the preceding, which it much resembles; it may, however, be easily distinguished by its rather broader form and less pubescent thorax, as well as by the lighter colour of the antennæ, of which the third joint is longer in proportion to the second; the tubercles on the forehead are more distinct and shining, the central channel of the thorax is more marked, and the subocellate punctures of the elytra are less deep; the sexual characters are also different, the male having the fifth ventral segment of the abdomen slightly impressed at apex, the same segment being almost entire in the female; the central line of the thorax and the humeral callosities are usually infuscate, and occasionally the elytra are marked with a more or less obsolete dark band. L. $2\frac{3}{4}-3\frac{1}{2}$ mm.

In marshy places; on willows, especially in osier beds, and also on alders and *Spiræa ulmaria*; locally common; London, Southern, and Midland districts, widely distributed; Yorkshire; Cheshire; Northumberland and Durham; Cumberland; Scotland, Solway, Tweed, and Forth districts; Ireland, Armagh.

ADIMONIA, Laicharting. (*Galeruca*, Geoffroy.)

This genus, as here constituted, contains about seventy-five species, which are chiefly found in Europe and Northern and Central Asia; a few, however, have been described from North America, Morocco and Algeria, and Southern Africa, and one from the Australian region; no less than forty-four are found in Europe, of which two only occur in Britain; they are larger than any of our other *Galerucæ*, and may be known by having the anterior coxal cavities closed behind, and the intermediate tibiæ armed with a small spur at apex; the upper surface is very finely pubescent, almost glabrous; the tarsi are rather wide, and have the third joint the broadest, and the tarsal claws are strong and armed with a tooth.

- I. Colour entirely black; antennæ longer, with the third joint longer in proportion to the second; thorax more deeply and closely punctured; size larger

A. TANACETI, L.

II. Colour of upper surface usually fuscous-brown; antennæ shorter, with the third joint shorter in proportion to the second; thorax less deeply and closely punctured; size smaller

A. *œlandica*, Boh.
(*villæ*, W. C.)

A. tanacetl, L. Of a uniform deep black colour, sometimes rather shining, sometimes rather dull, obovate, broad, upper surface almost glabrous, under-side sparingly clothed with dusky grey hairs, punctuation of upper surface very coarse, but coarser and stronger in some specimens than in others; head narrower than thorax, with the frontal tubercles moderately distinct; thorax twice as broad as long, with anterior angles projecting and posterior angles slightly obtuse, central furrow very broad and shallow; elytra much widened behind, with raised longitudinal lines which in some specimens are much more conspicuous than in others; legs moderate. L. 6–10 mm.

Male with the fifth ventral segment deeply impressed triangularly at apex.

On *Tanacetum vulgare*, &c., also in dry sandy and grassy places in various localities; local; London district, not uncommon, Darenth, Epping, Caterham, Reigate; Shipley; Hastings; Eastbourne; Brighton; Portsmouth district; Bournemouth; Bath; Swansea; Barmouth; Snowdon; Norfolk; Bewdley Forest; Knowle; Coleshill; Birmingham; Burnt Wood, Staffordshire; Louth, Lincolnshire; Northumberland and Durham district; Scotland, occasional, Solway, Tweed, Argyle, and Moray districts; Ireland, Dublin, Belfast, Antrim, Tyrone, &c.; Mr. Blatch informs me that he has taken the larva on the Devil's-bit Scabious at Knowle, and the perfect insect on wild thyme at Barmouth, &c.; it is by no means confined to the Tansy; I have taken it on the Llanberis side of Snowdon, where I expect its food plant was wild thyme.

A. œlandica, Boh. (*villæ*, W. C.; *rustica*, Steph.). Very like the preceding in general shape and appearance, but smaller on the average, and less convex, and of a pitchy-brown or fuscous-brown or sometimes almost brownish-testaceous colour above with the head black; the antennæ are shorter, and the frontal tubercles are rather larger, and the punctuation of the thorax is shallower and less close, and that of the elytra is not so strong; legs and under-side black. L. 6–9 mm.

Male with the fifth ventral segment deeply impressed triangularly at apex.

On sallows in marshy places; recorded by Stephens as taken in June and July on the borders of Whittlesea Mere, and always considered extremely rare; in August, 1878, however, Mr. Blatch found it in numbers in Wicken Fen, but, I believe, it has not been met with since; the females often have the abdomen much dilated, so that it raises the elytra and projects beyond them as in *Gastrophysa*.

SERMYLA, Chapuis. (*Agelasa*, Motschulsky.)

This genus, which has by many authors been included under *Agelastica*, is distinguished by having the anterior coxal cavities closed behind; the upper surface, at all events of the elytra, is strongly metallic; the

posterior tibiæ are armed with a distinct spur, and the tarsi are broad, and the claws are appendiculate; two species are at present known. one of which is locally abundant in Central Europe, and the other has been described from Japan.

S. halensis, L. Obovate, rufo-testaceous, with the antennæ and scutellum black, and the vertex of head and the elytra bright metallic green; legs testaceous with the tarsi and apex of tibiæ as a rule blackish; head rather large, antennæ long with the third joint longer than second and shorter than fourth; thorax transverse, rectangular, almost smooth in middle, distinctly and rather strongly punctured at sides, often with a trace of a central furrow; elytra widened behind middle, confusedly, thickly, and rather strongly punctured; legs long. L. $5\frac{1}{2}$ –7 mm.

On flowers, especially of species of *Galium*, and by sweeping in grassy places, especially near the coast; sometimes in great numbers; generally distributed and common from the Midland districts southwards; not so common in the north; Scotland, only recorded apparently from the Tweed district, "Berwick-upon-Tweed," Dr. Philip McLagan, Murray's Cat.

HALTICÆ.

The members of this division are distinguished from the *Galerucæ* by having the posterior femora thickened and formed for leaping, and the anterior coxæ not conically prominent at apex; they are, as a rule, very small insects, which vary much in shape, being usually more or less oval or oblong oval, but sometimes subglobose; the colours are often very brilliant, but a large number of species are of a uniform dark colour or testaceous; they feed on leaves, and in some cases do an immense amount of damage to various crops both in the larval and the perfect state; the larvæ do not call for any particular notice; they are elongate, linear and subcylindrical, more or less closely covered with outstanding fine hairs, as a rule yellowish, with small dark spots or patches; the head is of moderate size and rounded, with no visible ocelli; the thoracic segments much resemble those of the abdomen, except that the prothorax is furnished with a corneous scutum; the abdominal segments are nine in number, and together with the meso- and metathorax are covered with small scaly setigerous plates; the anal segment is narrow and rounded, and is furnished beneath with a bifid prolongation serving as a proleg; the beetle deposits its eggs either on the surface of the leaf, or under the outer pellicle, according to the species; the young larvæ in the first case feed on the outside of the leaves (*Haltica*), and in the second form galleries beneath the surface (*Phyllotreta*); when the larvæ that feed on the outside of the leaf desire to change into a pupa, they sometimes fix themselves by their anal segment to the under-side of the leaves, or occasionally bury themselves in the earth; those that feed beneath the surface undergo their changes in their galleries. (See Chapuis et Candèze, Cat. des Larves des Coléoptères, p. 266.) The sexes in the *Halticæ* are, as a rule, easily distinguished; in some species the male has the first joint of the

tarsi, or certain joints of the antennæ dilated; M. Allard remarks that he believes that in all the species, without exception, the males have a well-pronounced fovea on the posterior border of the last abdominal segment.

In the Munich catalogue published in 1876 one hundred and forty genera and fourteen or fifteen hundred species are enumerated as belonging to the tribe; in M. Duvivier's supplement, however, no less than forty-one new genera and nearly eight hundred species have been added, chiefly through the researches of Mr. Champion and the work of Mr. Baly and Mr. Jacoby; the members of the tribe appear to be widely distributed throughout the world; they are represented in Europe by about twenty-five genera and three hundred and seventy species, of which no fewer than twenty genera and about one hundred and seventeen species are found in Britain; some of these are very closely allied and require great care in their identification, and this to a certain extent is also true of the genera; the tables, therefore, given below must be regarded rather as guides than as absolutely trustworthy, and must not be made use of without the detailed descriptions; I have not made much use of the characters presented by the frontal tubercles and the under-side, as they are, in many cases, not very obvious; the same, however, may with reason be said of many of the distinctions here employed, the basal transverse impressions of thorax, for instance, being sometimes more or less obsolete; for more detailed information regarding the group the student is referred to the *Naturgesichte der Insecten Deutschlands*, vol. vi. part 4, p. 666, by Weise, especially to his tables on pp. 674—678, and also to Allard's "*Essai Monographique sur les Galerucites Anisopodes*" (*Ann. Fr.*, Sept. 14, 1859); in many points I have preferred to follow Thomson (*Skand. Col.* x. 252).

- I. Anterior coxal cavities open behind; elytra rarely punctate striate. (Sub-tribe *Halticides*, Thoms.)
 - i. Tarsi with the first joint very long, as long as half the tibia, second joint attached to the first by a socket joint LONGITARSUS, *Latr.*
 - ii. Tarsi with the first joint short or moderate, not longer than one-third of the tibia, second joint not attached to the first by a socket joint.
 1. Thorax with a more or less distinct transverse impression before base, not bounded by a longitudinal fold or impression HALTICA, *Geoff.*
 2. Thorax with an obsolete transverse impression before base, bounded on each side by a short but distinct fold or impressed line, which nearly touches the base HERMÆOPHAGA, *Foudr.*
 3. Thorax without transverse impression or longitudinal fold.
 - A. Form more or less elongate, not subglobose, oval, oblong oval, or obovate.
 - a. Elytra confusedly punctured or with indistinct rows of punctures at base, which become confused towards apex APHTHONA, *Chevr.*

- a*. Spur of hind tibiæ inserted in middle of apical edge; pygidium often bare or slightly exposed, without a central channel PHYLLOTRETA, Foudr.
- b*. Spur of hind tibiæ inserted at the outer side of apical edge; pygidium covered, with a double central channel for the reception of the apical sutural angles of the elytra.
- b. Elytra with strong and regular rows of punctures, which are continued to apex . . . BATOPHILA, Foudr.
- B. Form subglobose, almost hemispherical, very convex; pygidium with a central channel.
- a. Antennæ gradually thickened towards apex.
- a*. Mouth parts covered, or nearly covered, by prosternum; elytra confusedly punctured; colour testaceous, not metallic SPHÆRODERMA, Steph.
- b*. Mouth parts free, not covered by the prosternum; elytra with rows of punctures; colour metallic APTEROPEDA, Redt.
- b. Antennæ with the last three joints larger, forming a somewhat indistinct club . . . MNIOPHILA, Steph.
- II. Anterior coxal cavities closed behind; elytra, with few exceptions, punctured in rows. (Sub-tribe *Plectroscelides*, Thoms.)
- i. Antennæ 11-jointed; posterior tarsi inserted at the apex of the tibiæ.
- 1. Intermediate and posterior tibiæ simple, without a tooth on their outer side.
- A. Thorax without a transverse impression before base.
- a. Thorax with an oblique longitudinal impression or fold on each side of base.
- a*. Longitudinal impressions at base of thorax obsolete; elytra in proportion shorter and broader, confusedly punctured except sometimes in front; thorax in our species bright red, not metallic PODAGRICA, Foudr.
- b*. Longitudinal impressions at base of thorax very distinct; elytra in proportion more elongate and narrower, punctured in strong and distinct rows; thorax metallic, unicolorous with elytra MANTURA, Steph.
- b. Thorax without longitudinal impressions at base OCHROSIS, Foudr.
- B. Thorax with a transverse impression before base, which is sometimes very plain, and sometimes more or less obsolete.
- a. Transverse impression at base of thorax, as a rule, strong and distinct; * coxæ only slightly distant CREPIDODERA, Chev.

* In *C. ventralis* the transverse impression is often very obsolete; Weise classes this species with *Ochrosis* on the formation of the frontal tubercles, and it strongly resembles *O. salicariæ* in general appearance; the oblique impressions, however, at

- b. Transverse impression at base of thorax indistinct; posterior coxæ widely distant.
 - a*. Upper surface not pubescent . . . HIPPURIPHILA, Foudr.
 - b*. Elytra set with distinct rows of hairs . . . EPITRIX, Foudr.
- 2. Intermediate and posterior tibiæ with a tooth on their outer side before apex.
 - A. Head large without an elevated keel on forehead; labrum large; elytra (in our species) more or less confusedly punctured . . . CHÆTOCNEMA, Steph.
 - B. Head rather small, with an elevated curved frontal keel; labrum small; elytra punctured in rows . . . PLECTROSCELIS, Redt.
- ii. Antennæ 10-jointed; posterior tarsi inserted at some little distance before the apex of tibiæ . . . PSYLLIODES, Latr.

LONGITARSUS, Latreille. (*Thyamis*, Stephens; *Teinodactyla*, Foudras.)

The members of this genus may be distinguished by having the first joint of the tarsi very long, as long as half the tibia; the second joint is attached to the first by a socket joint, and the remainder of the tarsus may often be observed bent almost at right angles to the first joint; the head is triangular and projecting, with the frontal tubercles obsolete; the thorax is more or less transverse, with the sides and anterior and posterior angles more or less rounded, sometimes almost smooth, but usually more or less distinctly, although often very finely, punctured; the elytra are oval, or oblong oval, with the punctuation usually confused, but in a few species arranged in more or less distinct rows, especially towards base; the colour is variable, but is very rarely metallic; upwards of two hundred species have been described, of which no less than one hundred and three are found in Europe, and about forty occur in Britain; they are widely distributed, and a considerable number have been described from Central America and the tropical portions of North America; representatives also occur in North America, China, Palestine, India, Ceylon, the Atlantic Islands, South Africa, Tahiti, Cuba, Celebes, &c.

Many of the species are extremely closely allied, and in consequence are very hard in some cases to determine with certainty; this is more especially the case with those that are of a testaceous or rufo-testaceous colour; the distinctions of many of these depend largely on the colour of the upper and under-side, femora, &c., and unless they are killed and set while fresh the colour soon alters and becomes much darker, especially if laurel has been used; the distinctions also of punctuation and general shape are also hard to express in words, and in some cases are somewhat variable; in fact authors often differ considerably in describing the same species, and even contradict themselves in their tables and subsequent descriptions; it is obvious, therefore, that any tables must be regarded as

each side of the transverse impression are distinct, and it cannot therefore be classed with *Ochrosis* as here constituted; in the last European catalogue it is placed with *C. transversa*, &c., under the sub-genus *Arrhenocæla* of *Crepidodera*.

provisional, and must not be depended upon apart from the detailed descriptions; an hour or two's work, however, at an authentically named collection of the British species will enable the student of the group to determine his specimens with far greater ease than any mere descriptions can do.

- I. Elytra dark, with or without obscure lighter markings at base and apex; thorax dark, black or pitchy-reddish.
 - i. Elytra unicolorous.
 1. Elytra rather coarsely punctured.
 - A. Elytra entirely covering abdomen.
 - a. Elytra very closely and irregularly punctured, with the apex acuminate; size larger *L. NIGER*, Koch.
 - b. Elytra substriately punctured at base, with the apex of each separately rounded *L. PULEX*, Schrank.
(*obliteratus*, Rosh.)
 - B. Elytra not entirely covering abdomen . . . *L. ANCHUSÆ*, Payk.
 2. Elytra very finely punctured *L. ATER*, F.
(*parvulus*, Payk.)
 - ii. Elytra with the apex and often a spot at shoulders more or less obscurely reddish; form rather long, oblong ovate *L. ABSINTHII*, Kuts.
 - iii. Elytra with the apex broadly and distinctly reddish-yellow; form short, ovate *L. HOLSATICUS*, L.
 - iv. Elytra with a rather distinct yellowish spot on each at apex, and another at shoulders *L. QUADRIGUTTATUS*, Pont.
(*quadripustulatus*, F.)
- II. Elytra dark with broad yellow borders; thorax clear reddish-yellow *L. DORSALIS*, F.
- III. Elytra castaneous or reddish-brown, with the apex usually somewhat lighter.
 - i. Elytra lighter or darker pitchy red or brownish-red, set with long cilia at margins towards apex . *L. CASTANEUS*, Duft.
 - ii. Elytra dark brown, fuscous, or pitchy, without cilia at margins.
 - A. Thorax longer; punctuation finer *L. BRUNNEUS*, Duft.
 - B. Thorax shorter; punctuation coarser.
 - a. Thorax more distinctly punctured; average size larger *L. LURIDUS*, Scop.
 - b. Thorax less distinctly punctured; average size smaller *L. FUSCULUS*, Kuts.
- IV. Elytra testaceous or reddish-testaceous, with the suture always, and the side margins occasionally, darker, the colour of the suture being sometimes black and sometimes rufescent.
 - i. Form larger and broader; punctuation of elytra diffuse *L. AGILIS*, Rye.
 - ii. Form smaller and narrower; punctuation of elytra much closer.
 1. Elytra with the shoulders obliquely rounded.
 - A. Thorax pitchy black or black, very finely punctured, much narrower than elytra . . . *L. SUTURELLUS*, Duft.
(*fuscicollis*, var., Steph.)
 - B. Thorax pitchy red or testaceous, distinctly

- punctured, less narrow in proportion to elytra.
- a. Thorax with a metallic reflection . . . L. ATRICILLUS, L.
 - b. Thorax without metallic reflection.
 - a*. Elytra oval, broader.
 - a†. Punctuation of thorax and elytra stronger; shoulders of elytra less distinct . . . L. PATRUELIS, All.
 - b†. Punctuation of thorax and elytra finer; shoulders of elytra more distinct . . . L. MELANOCEPHALUS, De G.
 - b*. Elytra oblong oval, narrower.
 - a†. Head black; elytra confusedly punctured, the punctures being occasionally arranged in very indistinct rows near base . . . L. ATRICEPS, Kuts.
 - b†. Head reddish-testaceous.
 - a†. Size larger; elytra punctured in distinct rows towards base . . . L. DISTINGUENDUS, Rye.
 - b†. Size smaller; elytra confusedly punctured . . . L. ABDOMINALIS, Duft.
 - 2. Elytra with the shoulders not obliquely rounded.
 - A. Thorax black or pitchy.
 - a. Elytra distinctly punctured, with the suture only dark . . . L. SUTURALIS, Marsh.
 - b. Elytra more finely punctured, with the suture and all the margins dark . . . L. NASTURTII, F.
 - B. Thorax reddish-testaceous.
 - a. Size larger; elytra broader in proportion to thorax, very finely punctured . . . L. PICICEPS, Steph.
(atricapillus, Redt.)
 - b. Size much smaller; elytra narrower in proportion to thorax, rather distinctly punctured . . . L. LYCOPI, Foudr.
 - V. Elytra unicolorous testaceous or reddish-testaceous without darker suture.*
 - i. Antennæ widely distant at base; posterior tibiæ armed with a strong curved spur at apex; size larger . . . L. TABIDUS, F.
(verbasci, Panz.)
 - ii. Antennæ more approximate at base; posterior tibiæ armed with a short or moderate spur at apex; size smaller.
 - 1. Punctuation strong.
 - A. Elytra dehiscent at apex; head and under-side reddish . . . L. MEMBRANACEUS, Foudr.
(teucris, All.)
 - B. Elytra not dehiscent at apex.
 - a. Antennæ darker towards apex.
 - a*. Head black or pitchy black . . . L. BALLOTÆ, Marsh.
 - b*. Head red or reddish-testaceous.
 - a†. Under-side black with the last segment ferruginous . . . L. WATERHOUSEI, Kuts.
(pratensis, Panz. ?)

* In the var. *thapsi* of *L. tabidus* and the var. *Poweri* of *L. gracilis* the suture is infuscate; in *L. exoletus* it is sometimes ferruginous.

- b†. Under-side ferruginous.
- a‡. Size larger; thorax distinctly punctured L. FERRUGINEUS, *Foudr.*
- b‡. Size smaller; thorax very finely punctured L. CERINUS, *Foudr.*
- b. Antennæ unicolorous testaceous L. FLAVICORNIS, *Steph.*
2. Punctuation fine.*
- A. Femora black or pitchy black, at least at apex.
- a. Length $2\frac{1}{2}$ –3 mm.; elytra ovate, very finely punctured L. EXOLETUS, *L.*
(*femoralis*, Marsh.)
- b. Length $1-1\frac{1}{4}$ mm.; elytra ovate, usually very indistinctly punctured L. PUSILLUS, *Gyll.*
- c. Length 2 mm.; elytra oblong-ovate, finely, but rather distinctly, punctured.
- a*. Colour darker; head black or pitchy L. MEDICAGINIS, *All.*
- b*. Colour very pale; head reddish-yellow L. OCHROLEUCUS, *Marsh.*
- B. Femora yellow or reddish-yellow.
- a. Head, except forehead, and abdomen pitch-black; length $1\frac{1}{2}$ – $1\frac{3}{4}$ mm. L. REICHEI, *All.*
- b. Head and abdomen reddish or yellowish-red.
- a*. Length $3-3\frac{1}{2}$ mm.
- a†. Elytra yellow; punctuation finer L. JACOBÆE, *Wat.*
- b†. Elytra red; punctuation coarser L. RUTILUS, *Ill.*
- b*. Length $2-2\frac{1}{2}$ mm.
- a†. Elytra very light yellow, almost transparent; insect winged L. GRACILIS, *Kuts.*
- b†. Elytra pale reddish-yellow; insect apterous.
- a‡. Head and thorax impunctate; shoulders of elytra rounded L. LÆVIS, *Duft.*
- b‡. Head and thorax finely but distinctly punctured; shoulders of elytra prominent L. PELLUCIDUS, *Foudr.*

L. niger, Koch. Oblong-ovate, rather depressed, deep black; antennæ longer than half the body, thickened towards apex, black, with the basal joints yellow; thorax moderately convex, very finely punctured; scutellum almost round, smooth; wings ample; elytra widened behind, very closely and rather deeply punctured, acuminate at apex; legs yellow, with the posterior femora black; the species somewhat resembles *L. anchusæ*, but has the thorax more finely punctured, and broader at base, and the apex of the elytra differently shaped. L. $2\frac{1}{4}$ mm.

This species is very rare, and appears to require some confirmation as British; Mr. Crotch first introduced it in the first edition of his British catalogue, and records two old specimens in Mr. Wollaston's collection; there are also specimens standing under the name of *Thyamis nigra* in Dr. Power's collection from Birdbrook (Essex), Horsell and Mickle-

* In *L. rutilus* the punctuation is moderately strong, and in this respect it is intermediate between these two divisions.

ham, but it appears to me that they ought rather to be referred to *L. luridus*.

L. pulex, Schrank. (*obliteratus*, Rosh.). Oblong-ovate, deep black or pitchy black; antennæ longer than half the body, pale testaceous with the last joints darker; thorax very closely punctured, somewhat shagreened, often with a slight bronze reflection; scutellum transverse, rounded; wings absent or rudimentary; elytra convex, obtusely rounded at apex, rather distinctly and substriately punctured; legs testaceous-yellow, posterior femora pitchy black; under-side pitchy, smooth, and scarcely punctured. L. $1\frac{1}{4}$ – $1\frac{1}{3}$ mm.

Chalky places; on *Teucrium scorodonia* (Wood-sage), *Thymus serpyllum*, &c.; very local, but common where it occurs; Mickleham, Reigate, Caterham, Chatham, Sevenoaks, Bearsted; Dover; Folkestone; Swansea; Ireland, Armagh.

L. anchusæ, Payk. Larger than the preceding, from which it may also be known by its much stouter antennæ and darker legs, and by the fact that the elytra do not completely cover the abdomen; antennæ pitchy with base ferruginous; thorax closely and very finely punctured; scutellum rounded, smooth; wings absent, at all events in the males; elytra obliquely rounded at shoulders and dilated just behind middle, very obtuse and separately rounded at apex, dehiscent at sutural angle, moderately strongly punctured, not covering pygidium; legs testaceous or ferruginous with the posterior femora black, and the anterior and intermediate femora infusate except at apex. L. $1\frac{3}{4}$ –2 mm.

Chalky and sandy places; on *Echium vulgare*, *Cynoglossum*, *Anchusa*, &c.; local, but common where it occurs; Mickleham, Darenth Wood, Hammersmith, Claygate, Headley Lane, Bearsted, Maidstone; Bognor; Portsdown, near Portsmouth, abundant in June (Moncreaff); Bristol; Northumberland and Durham district, Sweethope and Wallington (Power).

L. ater, F. (*parvulus*, Payk.). Ovate, pitchy-brown, or black, with a slight bronze reflection, under-side black; antennæ longer than half the body, pitchy with base testaceous; thorax very finely punctured; scutellum small, triangular; wings present; elytra rather broad, very finely punctured, a point that will separate the species from *L. pulex*, which it much resembles; legs long, testaceous, posterior femora pitchy, anterior and intermediate femora often infusate at base; occasionally the bronze colour is very marked. L. 1 – $1\frac{1}{4}$ mm.

On low plants, and also, according to Allard, abundantly on the common horn-beam (*Carpinus betulus*); very local; London district, rare, Chatham, Dulwich; Whitstable; Birchington; Deal; Ditchingham, near Bungay, Suffolk, abundant (Power); Ashwicken and Wicken Fen; Markfield, Leicester; Portsmouth district; Seaton Down, Devon; Ireland, Rathkurby, near Waterford (Power); Belfast (Haliday) and Armagh (Johnson).

L. absinthii, Kuts. Closely allied to *L. anchusæ*, but distinguished by its colour which is slightly bluish, and by the more strongly punctured elytra which are less rounded at apex, and have two obscurely testaceous spots on each one at apex and another at shoulder, which are

often obsolete ; in the male, moreover, the fifth ventral segment is furnished with a small tubercle in the middle of apex ; the wings are short, and do not reach the apex of elytra ; the base of the antennæ and the legs are testaceous, the posterior femora being black, and the posterior tibiæ and anterior and intermediate tibiæ usually more or less infusate ; the general form is oblong ovate. L. $1\frac{1}{3}$ mm.

Salt marshes ; on *Artemisia maritima* ; very local, but common where found ; Chatham (Champion) ; Strood, in abundance, and Purfleet (Power) ; Reigate (Blatch) ; Whitstable ; Deal ; Mr. Moncreaff records it as "abundant on *Artemisia maritima*, Hamshaw (Portsmouth district), May and July, out again in October, hibernates in the perfect state."

L. holsaticus, L. Ovate, short and broad, black, shining, with the apex of each elytron furnished with a distinct reddish spot ; antennæ longer than half the body, gradually thickened towards apex, with the three first joints pale testaceous, and the remainder fuscous ; thorax very convex, with the sides scarcely rounded and distinctly margined, closely and very finely punctured ; scutellum short, triangular, smooth ; wings present ; elytra broad, dilated behind middle, rounded at apex, distinctly, closely, and rather deeply punctured ; legs dark, anterior tibiæ and tarsi reddish-testaceous. L. $1\frac{1}{2}$ mm.

Marshy places ; on *Equisetum*, *Pedicularis*, &c. ; local ; London district, Esher, Chobham, &c. ; Windsor ; Hastings ; New Forest ; Swansea ; Barmouth ; Coleshill, near Birmingham ; Repton ; Northumberland district, Newcastle and Twizell ; Scotland, local, Solway, Clyde, and Tay districts ; Ireland, near Waterford (Power), and Armagh (Johnson).

L. quadriguttatus, Pont. (*quadripustulatus*, F.). Rather a large and conspicuous species, oblong-ovate, convex, shining, black, with a slight bronze reflection, each elytron with two rather distinct reddish-yellow spots, one at apex and another at shoulder ; antennæ long and rather stout, dark, with the first four joints reddish-testaceous ; thorax not much broader than long, with sides only slightly rounded, distinctly and rather deeply punctured ; scutellum smooth ; wings present ; elytra rather long, not much broader at base than thorax, with shoulders very obliquely rounded, distinctly punctured ; legs testaceous, with the posterior femora black and the two anterior pairs more or less infusate at base. L. $2\frac{1}{2}$ – $2\frac{3}{4}$ mm.

On *Cynoglossum officinale* ; rare ; Hertford ; Suffolk ; near Belfast (Haliday).

It was probably on an obscure specimen of this species that *Dibolia cynoglossi* was erroneously introduced into the British list.

L. dorsalis, F. Oblong-ovate, rather depressed, black with the elytra broadly bordered with yellow and the thorax reddish-yellow ; head and thorax very finely punctured ; antennæ black, ferruginous at base ; thorax with sides slightly rounded, anterior margin sometimes blackish ; wings present ; elytra with sides evenly rounded, rather long,

separately rounded at apex, finely punctured; breast testaceous, abdomen black, scarcely punctured; legs ferruginous or pitchy, posterior femora black. L. $1\frac{1}{2}$ –2 mm.

Chalky and sandy places; on *Senecio jacobæa*, and also on *Senecio vulgaris*; locally common in the Isle of Wight on Rew Down, Ventnor, and in other places; Portsmouth district, Lumps Pond, Southsea; London district, local and not common, Folkestone, Bexley, Darenth, Mickleham, Southend (Champion, Power, and others).

L. castaneus, Duft. Ovate, shining, of a lighter or darker pitchy red or brownish-red colour, with the head, breast, abdomen and apex of posterior femora black or pitchy; antennæ and legs (except posterior femora) lighter than the rest of the body, the former rather short; thorax one and a half times as broad as long, smooth and shining, and finely punctured; elytra rather distinctly, but very variably, punctured, the punctuation becoming obsolete towards apex; they form a somewhat regular oval, and are obtusely rounded at apex; on the exterior margin towards apex they are furnished with long whitish curved cilia, which are the chief distinguishing mark of the species; immature specimens of this and the two following species are often almost entirely ferruginous. L. 2–2 $\frac{1}{2}$ mm.

Male with the first joint of the anterior tarsi strongly and orbicularly dilated, and the fifth ventral segment impressed with a very obsolete line in the centre.

On low plants, usually in marshy places; rare; Wicken Fen, in some numbers (Power and Crotch); Wallington, Northumberland (Power); Mr. Blatch records it from the Isle of Wight, Bristol, Gloucester, Bewdley, Sutton Park, and Knowle; it is probably often passed over.

The *T. castanea* of Stephens' collection is really *L. luridus*, and the specimens in the British collection were referred, as a rule, to *T. brunnea* prior to the appearance of Mr. Crotch's catalogue.

L. luridus, Scop., *nec* Gyll. Oblong-ovate, pitchy black or reddish-black, shining; antennæ comparatively short, dark, ferruginous at base; thorax transverse, rather distinctly punctured, with the sides rounded; scutellum short, smooth; wings absent or rudimentary; elytra with the shoulders obliquely rounded, strongly punctured in more or less distinct rows, interstices alutaceous, apices separately rounded; legs testaceous, with the posterior femora black or pitchy, and the anterior and intermediate pairs of femora often infuscate. L. $1\frac{1}{2}$ –2 mm.

Male with the first joint of the anterior tarsi dilated, the fifth ventral segment of the abdomen deeply impressed with a triangular fovea, and the posterior tibiæ curved on their lower margin.

On *Boraginaceæ*, nettles, and other low plants; common and generally distributed from the Northern-Midland counties southwards; rarer further north; Northumberland, Sweethope (Power); not recorded from Scotland; Ireland, Dublin, Waterford, and Belfast, and probably common.

L. brunneus, Duft. Extremely closely allied to the preceding, from which it may be distinguished by its greater convexity and by its elytra being much more curved laterally, with the shoulders effaced and not projecting, and the apex of each strongly rounded; the thorax is nearly as long as broad, and the punctuation of the elytra is finer. L. 2 mm.

On low plants; generally distributed and common in the London district, and probably throughout the greater part of England; Bold records it as common in the Northumberland district; Scotland, Solway and Moray districts; Ireland, near Waterford, Armagh, &c.

This species is so closely allied to *L. luridus* that the two species are perpetually being confused, and the records cannot be altogether trusted. Mr. Rye (Ent. Ann. 1869, 57) has the following remark regarding the two species, which up to that time were regarded as identical in Britain:—" *T. lurida* is said by M. Allard to have only *some analogies* (!) with *T. brunnea*; but it will certainly give any one who has a moderately large series of old *lurida* a puzzling day's work before he will be able to satisfy himself as to the specific difference of these two insects:" this remark all students of the group will cordially agree with; the extreme forms are not, perhaps, hard to distinguish, but intermediate forms appear to occur, which make it somewhat doubtful whether they ought really to be separated. Allard says that *L. brunneus* may be distinguished from all the other species of *Longitarsus* by its more thick-set and square form, which it owes to the fact that the thorax is long and almost as broad as the elytra, and he compares it to *Plectroscelis aridella*; the colour of both the species varies very much from light red to almost black. Dark examples of *L. luridus* bear a strong superficial resemblance to *L. anchusæ*, from which they may be distinguished by the more slender antennæ and stronger punctuation.

L. fuscus, Kuts. Oblong-ovate, subconvex, shining, fuscous or pitchy fuscous, with the shoulders, margin and apex of elytra, the base of the antennæ and the legs paler; thorax transverse, very finely granulose and very minutely punctured; wings absent; elytra with the shoulders scarcely prominent, separately rounded obtusely at apex, with thick distinct and confused rugose punctuation; the species is allied to the two preceding, but is smaller, and has the elytra more thickly punctured. L. $1\frac{1}{3}$ – $1\frac{1}{2}$ mm.

Male with the last segment of the abdomen furnished with a deep round fovea, and slightly bisinuate at apex; anterior tarsi with the first joint moderately dilated.

Very rare; described by Herr Kutschera from specimens sent him by Mr. G. R. Waterhouse. Highgate; Purfleet; Littleington, Cambridge.

L. agilis, Rye. Ovate, convex, shining, of a lurid testaceous colour, with the suture darker, at all events behind; under-side pitchy; the colour, however, is somewhat variable; antennæ pitchy with base reddish; thorax distinctly punctured; wings present; elytra broad,

diffusely, confusedly and rather strongly punctured, with the apices separately and obtusely rounded; legs brownish-testaceous with the posterior femora pitchy black, posterior tibiæ armed at apex with a very short and rather stout spur; in some specimens the suture of the elytra appears to be only slightly reddish, in others broadly pitchy. L. $2\frac{1}{3}$ – $2\frac{2}{3}$ mm.

On *Scrophularia aquatica* and *S. nodosa*; rare; Headley Lane, Mickleham; Bearsted, near Maidstone; Snodland and Staple (Kent); Balcombe; Hollington, near Hastings; the species was first described by Mr. Rye from specimens taken at Mickleham in September, 1863; but there is a very old specimen on a point in Dr. Power's collection, and there were also specimens in Mr. Laundry Brown's old collection, which were taken near Norwich or Horning.

L. suturellus, Duft. (*thoracicus*, Steph., All.; *fuscicollis*, var., Steph.). Ovale, rather short and convex, very finely punctured; head and thorax black or pitchy black, elytra testaceous with the suture broadly black, under-side pitchy black, diffusely punctured; antennæ fuscous with the three basal joints ferruginous; thorax convex, shining, extremely finely punctured; wings present; elytra much broader than thorax, short ovate, with shoulders obliquely rounded, very finely but somewhat distinctly punctured; legs ferruginous, femora brown, posterior pair pitchy. L. $1\frac{3}{4}$ –2 mm.

Male with the fifth ventral segment furnished with a smooth central line.

The var. *fuscicollis*, Steph., has the thorax pitchy, sometimes reddish.

By sweeping *Senecio jacobæa* and other plants; local, but not uncommon and generally distributed throughout the greater part of England; Mr. Gorham records it as abundant in the Isle of Wight, and Mr. Bold as very plentiful in the Northumberland and Durham district; the only Scotch record, however, is from the Solway district.

This species is allied to *T. suturalis*, from which it may be distinguished by its shorter and broader elytra, which are more finely punctured, and have the shoulders obliquely rounded, and also by the much darker colour of the antennæ and legs; from *L. atricillus* it may be separated by its shorter form and finer punctuation, and the colour of the thorax which is, as a rule, much darker, and presents scarcely a trace of metallic reflection.

L. atricillus, L. (*fuscicollis*, Foudr., nec Steph.). Oblong-ovate, shining, rather convex, head pitchy, thorax red with a strong metallic reflection, elytra ferruginous-testaceous, with the suture dark, under-side pitchy; antennæ dark with the four or five basal joints testaceous; thorax short, closely and finely, but distinctly, punctured; scutellum small, rounded; wings present, absent or rudimentary; elytra a little broader at base than thorax, rather long, closely and distinctly punctured; legs ferruginous or reddish-testaceous with the apex of the posterior femora broadly black or pitchy black; under-side closely punctured. L. $1\frac{3}{4}$ – $2\frac{1}{4}$ mm.

Male with the first joint of the anterior tarsi oval, somewhat dilated.

On *Medicago* and other low plants; local, but not uncommon; London district, common and generally distributed; Littlington, Cambridge; Hastings; Portsmouth district; Isle of Wight; Devon; Bristol; Knowle; Repton; Matlock; Barton Moss, Cheshire; Manchester district; Northumberland and Durham district, not uncommon; Scotland, Solway and Moray districts; Ireland, Dublin and Waterford, and probably widely distributed.

L. patruelis, All. Rather a large species, of a brownish-yellow colour, with the elytra often lighter, suture, and occasionally more or less of disc, dark, at all events behind; according to some authors it is smaller than *L. melanocephalus*, but the specimens that I have seen are quite as large or considerably larger; antennæ dark, with the base ferruginous; thorax finely but distinctly punctured; elytra oval, rather strongly punctured, the punctures running somewhat into striæ; legs ferruginous, sometimes more or less pitchy, with posterior femora black; the species is allied to *L. melanocephalus*, but may be known by the less evident shoulders of the elytra and their stronger punctuation. L. $2\frac{2}{3}$ –3 mm.

On *Verbascum*, &c.; rare; Darent Wood; Esher; Hastings district; Langworth Wood, Lincoln; Manchester district.

Several specimens of a *Longitarsus* were taken some years ago in a salt marsh near Dumfries, which Mr. Rye was inclined to refer to this species; he afterwards considered them to be intermediate between *L. patruelis* and *L. melanocephalus*, but probably distinct from either; some of the Dumfries specimens are very dark; a good many authors have believed *L. patruelis* to be the same as *L. lateralis*, Ill., but others consider this doubtful; M. Allard's description of *L. lateralis* certainly agrees well with some at least of our specimens of *L. patruelis*, and it is possible that we possess both species, if they are to be regarded as distinct.

L. melanocephalus, All. (*atricillus*, Foudr.; *atricapillus*, Duft.). Ovate, convex, head pitchy, thorax rufo-testaceous, elytra testaceous, with suture narrowly dark, under-side pitch-black; antennæ long and slender, pitchy with base testaceous; thorax short, very finely punctured; scutellum small; wings present; elytra oval, with the shoulders rounded, but marked, almost acuminate at apex, finely and closely, but distinctly, punctured; anterior pairs of legs testaceous with the femora usually pitchy, except at apex, posterior legs with the femora black, the tibiæ often pitchy, and the tarsi testaceous; under-side closely and distinctly punctured; the colour is variable, the thorax being sometimes pitchy red, and the whole of the legs, except posterior femora, being very often testaceous. L. $1\frac{1}{2}$ – $2\frac{1}{2}$ mm.

Male with the first joint of the anterior tarsi dilated, and the fifth ventral segment of abdomen triangularly incised in middle of apex.

By sweeping herbage; often found in haystack refuse, moss, &c.; generally distributed and common throughout the greater part of the kingdom.

L. atriceps, Kuts. (*melanocephalus*, De G. et Gyll., sec. Thoms., &c.). Smaller on the average than the preceding species, which it much resembles, with the elytra more oblong, and with the first joint of the tarsi and the apical spur of the posterior tibiæ shorter; the elytra also are rounded together at apex, and have the sutural angles almost right angles, and the second joint of the antennæ is rather longer in proportion; in colour the species much resemble one another, except that in *L. atriceps* the head and posterior tibiæ are, as a rule, more decidedly darker. L. $1\frac{1}{2}$ – $1\frac{3}{4}$ mm.

By sweeping herbage; rare; Darenth Wood; Shirley; Wootton, near Dorking; Devon (Wollaston); Chat Moss (Reston).

L. distinguendus, Rye. Oblong, head and thorax shining, elytra very finely alutaceous and therefore a little duller, ferruginous-testaceous, or testaceous, with the under-side darker, and the greater part of the posterior femora, the apical joint of the tarsi, and the six or seven apical joints of the antennæ more or less, pitchy black; antennæ rather stout, almost as long as the body; thorax closely and finely, and often obsoletely, punctured; wings absent; elytra rather long, with shoulders obliquely rounded, but slightly prominent, suture narrowly darker, usually rufescent, sutural angles somewhat obtuse, punctuation rather deep, arranged in rows towards base. L. 2 – $2\frac{1}{2}$ mm.

Male with the last ventral segment furnished with a smooth longitudinal impression in the centre, and the posterior margin incrassate; the basal joint, moreover, of the anterior tarsi is triangularly produced and dilated internally towards apex.

On *Teucrium scorodonia* and *Scrophularia nodosa*; very local and usually rare; Mickleham (Rye); Chatham (Walker); Box Hill, in profusion in September and October (Champion).

Mr. Rye, in his description, compares this species with *L. atricillus*, from which it may be easily known by not having a dark brassy head and thorax, and by the fact that the punctures on the elytra are more or less disposed in rows; the posterior tarsi also are longer and the antennæ are stouter, and the general colour is lighter, the suture in *T. atricillus* being fuscous and not rufescent.

L. suturalis, Marsh. (*nigricollis*, Foudr.). Ovate, not very convex, with the head, thorax, suture of elytra, chief part of posterior femora, apical joint of tarsi, antennæ, except base, and under-side, black, and the elytra, except suture, pale testaceous; head large, antennæ long and slender; thorax with sides rounded, distinctly punctured; scutellum pitchy, smooth; wings ample; elytra with shoulders projecting and not obliquely rounded, rather long, rounded at apex, with the sutural angle obtuse, somewhat strongly and very distinctly punctured; legs, except posterior femora, testaceous. L. 2 – $2\frac{1}{3}$ mm.

On low plants, but I do not know to what species it is attached ; it has, however, been recorded as taken in Devon by sweeping heath ; it appears to be rare, and other species often do duty for it in collections, especially *T. suturellus*, var. *fuscicollis*, from which it may be at once known by its longer form, more pronounced shoulders, and much more distinct punctuation ; London district, Merton, Birdbrook, &c. ; Weston, Oxon ; Glanvilles Wootton ; Swansea ; Repton ; Bold records it as rare in the Northumberland and Durham district, and as most frequently occurring on the sea-banks ; Scotland, " Raehills, near Edinburgh " (Stephens) ; this record, however, is not noticed by Dr. Sharp in his Scotch list.

L. nasturtii, F. (*circumscriptus*, Bach.). Very closely allied to the preceding, but distinguished by its smaller size and shorter form, and the closer and finer punctuation of the elytra, but especially by having all the margins of the elytra very narrowly, but distinctly, dark ; the general colour of the antennæ and legs is also somewhat darker ; in the male the posterior tibiæ are curved on their lower margin, and the fifth ventral segment of the abdomen is furnished with a small tubercle at apex. L. $1\frac{1}{2}$ – $1\frac{3}{4}$ mm.

Sandy places ; on *Echium vulgare*, &c. ; rare ; Shirley, Mickleham, Lee, Claygate, Darenth, Birch Wood, Cowfold ; Ditchingham, Suffolk ; Cambridge district ; Glanvilles Wootton ; Knowle, near Birmingham ; near Burton-on-Trent ; Strensall, York.

L. piciceps, Steph. (*atricapillus*, Redt. ; *picipes*, All. ; *Foudrasi*, Crotch). Oblong-ovate, not very convex, rather shining, with the head, breast, abdomen, suture of elytra, posterior femora, tarsal claws and apex of antennæ black or fuscous, and the thorax, and elytra, except suture, testaceous ; the thorax is often reddish ; antennæ rather long and slender ; thorax very finely punctured, much narrower than elytra ; scutellum small, black ; wings present ; elytra with shoulders very marked, almost square, sides subparallel, apex rounded, punctuation very close and fine ; under-side scarcely punctured. L. $2\frac{1}{4}$ mm.

Male with the fifth ventral segment of abdomen furnished with a central channel, which is dilated behind into a fovea.

On *Senecio jacobæa* ; very local, but common where it occurs ; Darenth Wood, Chatham, Shirley, Mickleham, Cowfold, Caterham ; Repton ; Northumberland district, Hartley and Gosforth, rare.

It is probable that this and several of the allied species occur in many more localities than are at present known ; the nomenclature, however, is so confused, and the species are so closely allied that collectors either neglect the group altogether, or fall into errors for want of authentic types ; the synonymy given above for the present species is that adopted in the last European catalogue, but it is apparently not accepted by Herr Kutschera, who says that the *T. atricapilla* of Waterhouse's catalogue, to which apparently *T. piciceps* must be referred (although Mr. Waterhouse omits that insect altogether from the catalogue), is the species described by Foudras as *T. atricilla*, and certainly different from *T. picipes*, Foudr., Kutsch. (*atricapilla*, Redt., 1st Ed.) ; in the European

catalogue the *T. Poweri* of Allard is referred to *T. piciceps*; Mr. Rye referred it to *T. gracilis*; I have a single specimen that was returned to me from the Continent, I believe by M. Brisout, as probably *T. Poweri*, and see no reason why it should not be an immature example of *T. piciceps*, except that the shoulders of the elytra are not quite so marked.

L. lycopi, Foudr. (*tantulus*, Foudr.). A very small species, of rather elongate form, which is, however, variable and shorter in some specimens than in others, convex, ferrugino-testaceous, with the head, breast, abdomen and apex of posterior femora pitchy black; suture of elytra pitchy black, sometimes ferruginous; the apex of the abdomen is also occasionally reddish; antennæ yellow, fuscous towards apex, head usually darker than thorax; thorax finely, but distinctly, punctured; wings present; elytra rather strongly punctured, the punctures being arranged in more or less distinct rows towards base, and becoming feebler behind, shoulders not strongly marked; legs, except posterior femora, reddish-testaceous. L. $1\frac{1}{3}$ – $1\frac{1}{2}$ mm.

On *Boraginaceæ*, *Lycopus Europæus*, &c.; in sand pits, &c.; very local, and, as a rule, not common, although occasionally it occurs in abundance; Shirley (Champion); Claygate, Horsell, and Mickleham (in the latter place abundantly, Power); Hastings district; Glanvilles Wootton (Wollaston).

L. abdominalis, Duft. Closely allied to *L. lycopi*, Foudr., and at first included under this species by Allard; it differs, however, in being of a slightly darker colour, with the punctuation evidently stronger and the shoulders obliquely rounded; the elytra, moreover, are more convex; the general colour is ferrugino-testaceous, with the antennæ and legs pale and the posterior femora pitchy black. L. $1\frac{1}{3}$ – $1\frac{1}{2}$ mm.

On the ground ivy, *Nepeta Glechoma*; two specimens taken by Dr. Power at Hammersmith Bridge on May 24th, 1862, and named in his collection as *Thyamis canescens*, which appears, from the description given by M. Allard, to be a closely allied species; *L. lycopi* occurs on the Gipsy Wort (*Lycopus Europæus*) and *Boraginaceæ*, as before mentioned, and not on *Nepeta*.

L. membranaceus, Foudr. (*teucarii*, All., *nec minusculus*, Foudr.). Ovate, convex, shining, of a reddish-yellow or ferruginous colour, with the apex of the antennæ, the head, thorax and posterior femora lighter or darker ferruginous or pitchy; under-side reddish; antennæ rather long; thorax moderately convex, with sides strongly rounded, somewhat distinctly punctured; scutellum small; wings absent or rudimentary; elytra at base a little broader than thorax, dilated behind, rather strongly punctured, dehiscent at apex, with the shoulders obliquely rounded, but more evident in some specimens than in others; legs, except posterior femora, testaceous; under-side finely punctured. L. $1\frac{1}{3}$ – $1\frac{1}{2}$ mm.

On *Teucrium scorodonia*; local, but common where it occurs; Mickleham, Esher,

Shirley, Darent Wood, Crohamhurst, Chatham, Gravesend; Dover; Hollington, near Hastings; Lee Valley, North Devon; Knowle, near Birmingham; Repton; Heysham, near Manchester; Scotland, Balmuto, Fifeshire (Power); the latter specimens have the head and thorax rather darker than is usually the case, and the elytra a little more strongly punctured, but can hardly be considered as a constant variety.

L. ballotæ, Marsh. Oblong-ovate, convex, head and under-side pitchy black, thorax and elytra reddish-testaceous; antennæ rather long, testaceous, darker towards apex; thorax rounded at sides, moderately convex, a little compressed towards anterior angles, rather distinctly and somewhat rugosely punctured; scutellum small, testaceous; elytra moderately long, rather dull, obliquely rounded at shoulders, rounded and subacuminate at apex, closely, deeply and distinctly punctured, with the interstices alutaceous, or more or less distinctly cross-reticulate; legs testaceous, with the posterior femora pitchy or pitchy black; under-side shining black, obsolete punctured; the punctuation and colour of the under-side will easily separate this species from the preceding. L. $1\frac{3}{5}$ – $1\frac{3}{4}$ mm.

On *Ballota nigra* and *Marrubium vulgare*; local, but common where it occurs; Darent Wood, Headley Lane, Faversham, Crohamhurst, Chatham, Gravesend, Sheerness; Walton-on-Naze; Birchington; Ditchingham, near Bungay, Suffolk; Norfolk; Wicken Fen; Swansea.

L. Waterhousei, Kuts. (*pratensis*, Panz. ?). Ovate, convex, shining; head ferruginous, with the vertex darker and the labrum pitchy; thorax rufo-testaceous, elytra testaceous; antennæ fuscous, with base testaceous; thorax transverse, somewhat rugosely and distinctly punctured; wings present; elytra ovate, with the shoulders somewhat prominent, rather strongly punctured, the punctures being usually confused, but sometimes disposed in indistinct rows towards base; abdomen black, with the last segment and the pygidium ferruginous; legs testaceous with the apex of the posterior femora reddish or ferruginous, posterior tibiæ with a long apical spur. L. 2 mm.

By sweeping herbage; rare; Chatham (Champion); Chattenden, Kent; Esher (Power); Mickleham (Rye); Wicken Fen (Power).

This species is allied to *L. ballotæ* and *L. lycopi*; from the former it may be known by its more shining and less closely punctured elytra, and from the latter by its larger size, greater breadth, and the coarser punctuation of the elytra. Rye (Ent. Ann. 1869, 58) says that it may briefly be described as *T. flavicornis* with the six apical joints of its antennæ more or less blackened. By many authors it is identified with *T. pratensis*, Panz.; it is quite possible that this is correct, but there seems to be so much confusion regarding this species, that I have preferred to adopt Herr Kutschera's name, at all events for the present.

L. ferrugineus, Foudr. This species is distinguished from the

preceding by its darker and more or less ferruginous colour, smaller size, rather stouter antennæ, and more closely punctured thorax and elytra; the latter are much narrower, with the punctuation arranged in distinct rows towards base, and have a less gelatinous appearance; from *L. flavicornis* and *pellucidus* it may be known by its smaller size and much stouter antennæ, of which the five or six apical joints are blackish; it is also much more coarsely punctured than the latter species. L. $1\frac{1}{2}$ – $1\frac{3}{4}$ mm.

By sweeping herbage; very rare; Caterham (Champion); Mr. Rye also records two specimens from his own collection without locality; it is very much to be regretted that so many valuable localities are lost to us, owing to the fact that Mr. Rye never labelled or numbered his specimens.

L. cerinus, Foudr. Oblong-ovate, reddish or ferruginous-testaceous, labrum brown, under-side ferruginous; antennæ testaceous, darker towards apex; thorax finely punctured; wings present; elytra moderately strongly and somewhat rugosely punctured; legs testaceous, posterior femora darker at apex; from the preceding species it may be known by its very finely punctured thorax, and from *L. ballotæ*, which it considerably resembles, it may be distinguished by having the under-side ferruginous instead of black, and by the somewhat less strong punctuation of the elytra, which appears to be somewhat variable as regards its arrangement. L. $1\frac{1}{2}$ mm.

By sweeping herbage; very rare; Mickleham (Rye); Dr. Ellis records it doubtfully from Wallasey, near Liverpool; the character of the ferruginous under-side is very misleading, as, unless the specimens are fully matured, those species which are distinguished by having the under-side pitchy black appear to have this part more or less reddish; it must, therefore, be only considered in conjunction with other characters, and if possible in a number of specimens; in species like the present, of which only one or two British examples are recorded, it is extremely hard to determine with exactness their real identity.

L. flavicornis, Steph. (*rubiginosus*, Foudr.). Ovate, convex, upper and under surface ferruginous, mouth pitchy, head antennæ and legs testaceous, posterior femora darker; antennæ long, slightly paler at base; thorax a quarter broader than long, evenly rounded at sides, convex, closely and strongly punctured; scutellum triangular; wings absent; elytra at base scarcely wider than base of thorax, dilated in middle, and narrowed behind, forming a regular oval, shoulders completely effaced, apices separately rounded, punctuation deep and strong; the entirely testaceous antennæ and strong punctuation will separate this species at once from all our other members of the genus. L. $2\frac{1}{4}$ – $2\frac{1}{2}$ mm.

On *Eupatorium cannabinum*, &c.; rare; Mickleham; Claygate; Cowley; Ditchingham, Suffolk; Wicken Fen; Hastings district; Lee Valley, North Devon; Barnwood, Gloucester; Repton.

This is the last of the more coarsely punctured species; in those that follow the punctuation is either fine, very fine or almost absent, that of *L. rutilus* alone being intermediate.

L. exoletus, L. (*femorialis*, Marsh., *nec* Redt. ; *pratensis*, Foudr., *nec* Panz.). Rather a large species, with the head dark, the vertex being lighter, the thorax testaceous or reddish-testaceous and the elytra pale testaceous ; antennæ long, fuscous with base testaceous ; thorax a little broader than long, very finely punctured ; scutellum small, ferruginous ; wings more or less developed ; elytra oval, finely punctured, with the suture sometimes slightly reddish ; under-side of thorax ferruginous, of the rest of the body pitch-black, distinctly punctured ; legs testaceous, posterior femora pitchy black, except at base, posterior tibiæ armed with a large spur. L. $2\frac{3}{4}$ –3 mm.

On *Echium vulgare* and *Convolvulus sepium* ; locally common ; Mickleham, Darenth Wood, Croydon, Bearsted near Maidstone, Sheerness, Whitstable ; Ditchingham, Suffolk ; Dover ; Folkestone ; Brighton ; Eastbourne ; Glanvilles Wootton ; Chesil Beach ; Bristol ; Swansea ; York ; Northumberland and Durham district, not common ; Scotland, Forth district.

L. pusillus, Gyll. A small, short and rather convex species, of a pale testaceous colour, with the head, breast, abdomen and apex of posterior femora pitchy black, and the thorax pitchy black or ferruginous ; head large, antennæ moderately long, testaceous at base, fuscous towards apex ; thorax short, very finely punctured, often redder on disc than at sides ; scutellum pitchy ; wings present ; elytra broader than thorax, very finely and more or less indistinctly punctured, obtusely rounded at apex ; legs, except posterior femora, reddish-testaceous, posterior tibiæ with a small spur at apex. L. $1-1\frac{1}{4}$ mm.

Male with the first joint of the anterior tarsi slightly dilated, and the fifth ventral segment furnished with a broad triangular fovea.

On *Thymus serpyllum* ; locally common ; Shirley, Mickleham, Caterham, Norwood, Aylsham, &c. ; Chatham ; Suffolk ; Margate ; Hastings ; Eastbourne ; Isle of Wight (common) ; Bristol ; Barmouth ; Sutton, near Birmingham ; Hunstanton ; Repton ; Chat Moss and Barton Moss ; Northumberland and Durham, grassy places in woods on sea banks, &c., common ; Scotland, Solway district ; Ireland, near Waterford and Armagh.

This species may easily be distinguished by its small size from all those that precede it, some of which it resembles in colour ; the lengths of the various species are certainly given erroneously by different authors ; Allard states the length of this species to be $1\frac{1}{2}$ mm., and then says that it is distinguished by its *much* smaller size from *T. nasturtii*, to which he assigns $1\frac{3}{4}$ mm. ; Thomson says that *L. pusillus* is in length vix $\frac{1}{2}$ lin., and he is certainly nearest the truth.

L. Reichei, All. Oblong-ovate, head, except forehead, and under-side, except of thorax, black, thorax and elytra testaceous, anterior margin of the former often pitchy ; antennæ rather long, with the first four or five joints testaceous and the rest fuscous ; thorax short, not closely, finely, and obsoletely punctured ; elytra with the shoulders marked, although not projecting, rather long, separately rounded at apex, closely and finely punctured ; legs moderately long, pale testaceous, posterior femora a little darker, sometimes reddish. L. $1\frac{1}{2}$ – $1\frac{3}{4}$ mm.

By sweeping herbage; rare; Purfleet; Littleington and Wicken Fen, Cambridge; Needwood, Staffordshire (Gorham); Northumberland district, banks of the Irthing, near Gilsland, rare.

This species appears to be closely allied to the preceding, but is larger, with the elytra longer and more oblong and less finely punctured, and the posterior femora testaceous or reddish; there is, however, considerable confusion regarding it, and immature specimens of *L. pusillus* appear to do duty for it in collections; the testaceous colour in life is very light, according to M. Allard, but it appears to become much darker after death.

L. medicaginis, All. According to M. Allard, this insect is exactly like *L. pusillus* both in structure and colour, but it is twice as large, and is distinguished by its more convex thorax, which is a little compressed in front at each side, and by the fact that the elytra are much less obsoletely punctured, the punctuation being fine and close, but distinctly visible; the thorax, as a rule, appears to be redder than in *L. pusillus*, and the under surface, as well as the upper, is more distinctly punctured. L. $1\frac{3}{4}$ –2 mm.

On *Ballota nigra* and in lucerne fields; very rare; introduced by Mr. Crotch on five or six specimens in Mr. Wollaston's collection, apparently without locality, and confirmed subsequently as British by M. Allard some ten years after its introduction; Allard gives the lengths of this and *L. pusillus* as $1\frac{4}{5}$ and $1\frac{1}{2}$ mm. respectively, and then states that *L. medicaginis* is twice the size of *L. pusillus*.

L. tabidus, F. (*verbasci*, Panz., Steph., &c.). The largest and most conspicuous of our species; ovate or oblong-ovate, convex, shining, with the upper side testaceous or livid-testaceous, the head and suture being often ferruginous; antennæ long, testaceous, fuscous towards apex, or fuscous with base lighter; thorax with strong margins, almost impunctate; scutellum rather large, smooth; wings present; elytra broad, with shoulders not very marked, separately rounded at apex, very finely punctured; legs testaceous, with the posterior femora dark at apex, and the anterior pairs usually more or less infusate, posterior tibiæ with a long and stout curved spur at apex, under-side fuscous or pitchy. L. 3–4 mm.

V. thapsi, Marsh. In this variety the suture is dark, and the greater part of the antennæ and legs is infusate; the under-side is also of a darker colour; in structure it agrees with the type, and cannot be regarded as a separate species; in the ordinary forms the under-side is sometimes red, and varies from this to nigro-piceous; and the suture of the elytra is either unicolorous or more or less ferruginous.

On *Verbascum thapsus*; local, but common where it occurs; Mickleham; Seven-oaks; Dover; Amberley; Portsmouth district; Norfolk; Suffolk; Hertford; Devon; Swansea; Malvern Hills; Scarborough.

L. jacobææ, Wat. (*tabidus*, Ol., nec F.). Oblong-ovate or ovate,

of a pale yellow testaceous colour, which, however, is variable, and is lighter when the insect is alive, with the antennæ brownish towards apex, and an indistinct spot on posterior femora darker; the mouth parts are also blackish; thorax with very distinct margins, moderately convex, very finely punctured; scutellum small, smooth; wings present; elytra much broader than thorax, with the shoulders well marked and the sutural apical angles obtuse, finely punctured, the punctuation being much more obsolete in some specimens than in others. L. 2–3 mm.

Male with the first joint of the anterior tarsi dilated, and the last ventral segment broadly foveolate, the fovea being impressed with a smooth line in middle.

On *Senecio jacobæa* (Ragwort); common and generally distributed throughout the greater part of the country.

The colour of this species varies considerably, and is occasionally in extreme specimens reddish-testaceous or dark reddish; these specimens usually do duty for *L. rutilus* in our collections, from which species they may be known by their distinctly finer punctuation; the variety does not appear to be named, and I would therefore propose to call it *v. rufescens*.

L. rutilus, Ill. Very closely allied to the preceding, but distinguished by its much stronger and more evident punctuation, which on the elytra is disposed in striæ near the base, and the longer and more slender first joint of the posterior tarsi; from all ordinary examples of *L. jacobææ* it may be known by its deep reddish colour; the specimens I have seen are also rather smaller than is usually the case in the last-named species; the food plant also appears to be different. L. $2\frac{1}{2}$ –3 mm.

On *Scrophularia aquatica*; rare; the only specimens of the true *T. rutila* that I have seen were taken by Mr. Moncreaff at Hayling Island, near Southsea; it has also been recorded from Weybridge and Hastings.

L. ochroleucus, Marsh. This species may at once be known by the very pale whitish testaceous colour of the upper side and the black apex of the posterior femora; the mouth is also black, and the apex of antennæ fuscous; the breast is brownish; the thorax is almost smooth; wings ample; elytra much broader than thorax, with the shoulders well marked, apex rounded, rather depressed on disc, very finely and closely punctured; apical joints of tarsi and claws fuscous. L. $2-2\frac{1}{4}$ mm.

Male with the last ventral segment of abdomen furnished with a central furrow, which is dilated at apex into a triangular fovea.

By sweeping herbage; locally common; Stephens records it as "extremely abundant in several parts of the country in fields, especially where turnips are grown, in June and July;" Weybridge, Mickleham, Darenth Wood, Birch Wood, Horsell, Gravesend, Sheerness; Ditchingham, Suffolk; Wicken Fen; Shipley, near Horsham; St. Leonards; Glanvilles Wootton; Isle of Wight; Devon; Swansea; Ticknall, near Derby; Liverpool; Scotland, Edinburgh (Stephens) and Kircaldy (Power); Ireland, near Dublin.

L. gracilis, Kuts. Oblong ovate, rather depressed, shining, of a whitish-testaceous colour, with the head, breast and abdomen pale ferruginous and the mouth pitchy; antennæ rather long, dark with the base light; thorax very finely punctured, or almost smooth; wings present; elytra ovate, semi-transparent, with the shoulders moderately transparent, and the apices separately rounded, very finely and confusedly punctured, the punctures being sometimes almost obsolete; legs testaceous, with posterior femora sometimes slightly darker, posterior tibiæ with a short spur at apex, last joints of tarsi and the claws pitchy. L. $1\frac{1}{2}$ – $1\frac{3}{5}$ mm.

Male with the fifth ventral segment of abdomen furnished with a thin longitudinal line, and bisinuate at apex.

On *Senecio jacobæa*; locally common; Mickleham, Caterham, Darenth Wood, Bearsted near Maidstone, Bushey, Wootton, Reigate, Whitstable, Southend; Ulting, Essex; Wicken Fen; Hastings; Lee Valley, Devon; Chat Moss; Bowdon, Manchester; Northumberland district, Sweethope (Power); Ireland, near Waterford (Power).

This species much resembles *L. ochroleucus*, but may be distinguished by the absence of the black colouring at the apex of the posterior tibiæ; the thorax also is broader than in that species.

A species was described by Allard, and named by him *Thyamis Poweri* as closely resembling *T. gracilis*, but differing from that species in having the vertex, scutellum, sutural margins of the elytra, breast and abdomen brown, the joints of the antennæ longer, the seven apical joints being darker, and the punctuation of the thorax closer and more distinct, and of the elytra more evident; four specimens were taken by Dr. Power at Mickleham; Rye referred the species to *T. gracilis*, and says that neither of the two specimens which he had seen possessed all the characters given by M. Allard, which at most are not very pronounced; in the European catalogue the species is given as synonymous with *T. piciceps*, Steph. Rye is, however, probably right in referring Dr. Power's specimens to *T. gracilis*.

L. lævis, Duft. Oblong ovate, almost obovate, convex, shining, of a pale testaceous colour, with the labrum fuscous black, under-side and apex of posterior femora light ferruginous; antennæ very long, nearly as long as the body, testaceous, with the last two or three joints darker; thorax convex, nearly smooth, or with a few very fine scattered punctures; wings absent; elytra with the shoulders rounded and effaced, almost impunctate or very finely punctured, the punctuation being more visible at base; under-side obsoletely punctured; posterior tibiæ with a small very short spine at apex. L. $1\frac{2}{3}$ –2 mm.

Male with the fifth ventral segment of the abdomen furnished in the centre with a very smooth and shining blackish line.

On *Chrysanthemum*, *Artemisia*, &c.; locally common and very widely distributed; Dulwich, Weybridge, Mickleham, Chatham, Sheerness, Whitstable; Dagenham, Essex; Wicken Fen; Deal; Dover; Hastings; St. Leonards Forest; Eastbourne;

New Forest; Barnwood, Gloucester; Repton; Northumberland and Durham district, not uncommon; Scotland, Forth district, and probably general in the South; Ireland, near Waterford.

L. pellucidus, Foudr. (*testaceus*, All.). Allied to the preceding, from which it may be known by its more prominent shoulders, and the more distinct punctuation of the elytra, as well as by having the posterior femora more broadly ferruginous, and the breast and abdomen pitchy, the latter being obscurely testaceous at apex; the antennæ are long, scarcely darker at apex, and the apex of the labrum is infusate; thorax rather distinctly punctured; wings absent or rudimentary; elytra not strongly but distinctly punctured, with the shoulders distinct, although rounded, and the sutural apical angles very obtuse; under-side somewhat variable in colour, the colour being as above described in mature specimens, but lighter in those that are immature. L. $1\frac{3}{4}$ –2 mm.

On *Trifolium* and *Mentha*; local, and, as a rule, not common; Mickleham, Darent Wood, Croydon, Birdbrook (Essex), Maidstone, Whitstable, Sheerness; Ditchingham, Suffolk; Hunstanton, Norfolk; Wicken Fen; Isle of Wight; near Repton (W. Garneys).

Thomson records twenty-six species of this genus from Norway and Sweden, but only nine are mentioned in Dr. Sharp's Scotch list; a few have been found in Scotland besides these, and Dr. Sharp remarks that the species are probably more numerous than those he records; it is evident, however, that the genus is rare in Scotland, and only sixteen have apparently occurred in Northumberland and Durham.

HALTICA, Geoffroy. (*Graptodera*, Chevrolat.)

This genus contains rather more than a hundred species, which are very widely distributed, representatives being found in almost all the temperate and tropical regions of the world; they are characterized by having the anterior coxal cavities open behind, and the thorax furnished at base with a transverse furrow, which is, however, not bounded by a longitudinal fold on each side; the head is furnished with distinct frontal tubercles; the general form is oblong, and the species are always winged; the colour is blue or greenish-blue; there are about a dozen European species, of which six or seven are British; they are, however, in several instances so closely allied that it is very difficult to determine them with accuracy, and, in spite of its being so small in point of numbers, the genus is really one of the most difficult that we have to deal with; the shape of the male intromittent organs seems to afford important points of difference, but they are in many cases obscure, and require to be studied, if possible, in fresh specimens, or in specimens that have been mounted with this organ exerted in such a position that it can easily be examined; I have, therefore, not made much use of the characters to be drawn from them, but a complete table is given by Weise (*Naturgesichte der Insecten Deutschlands*, vol. vi. part v. page 829), to which the student of the group is referred; the chief distinctions lie in the presence

or absence of a furrow on the upper surface and its shape, the formation of the apex (whether rounded truncate or angled), and the relative width of the longitudinal striæ on the under surface ; the larvæ do not call for any particular remark, being yellowish, or brownish-yellow, cylindrical grubs, somewhat narrowed behind, with the head, prothorax, legs and the plate covering the anus black ; the upper surface is set with fine granulations and larger black tubercles ; the chief part of the following table is taken from Weise (l.c. p. 830).

- I. Mandibles with three teeth, gradually decreasing in length, the lower one sometimes obsolete ; frontal tubercles usually well defined, larger than the circular borders round the base of the antennæ ; average size larger.
- i. Thorax narrower, about half as broad at base as elytra at shoulders, with comparatively broad side margins, which, if viewed from above, are visible as far as the anterior angles

H. TAMARICIS, Schrank.
- ii. Thorax at base almost as broad as, or evidently narrower than, elytra, with narrow side margins, which, if viewed from above, are hidden on the front half at all events near the anterior angles.

1. Upper surface of thorax and elytra, if viewed sideways, forming a continuous outline ; elytra only a little broader than the thorax with the callosities at shoulders less pronounced.

A. Elytra gradually widened behind, broadest behind middle ; third joint of antennæ only a little longer and narrower than the second ; colour usually dark blue ; punctuation of elytra finer

H. LYTHRI, Aubé.

B. Elytra subparallel until behind middle ; third joint of antennæ twice as long and plainly narrower than second ; colour greenish-blue ; punctuation of elytra stronger

H. FRICETI, All.
(♂ *longicollis*, All. ?).

2. Elytra raised and then depressed at base, not forming a continuous outline with thorax, if viewed sideways, considerably broader at base than thorax, with the shoulders and humeral callosities more pronounced ; colour green or bluish-green

(H. AMPELOPHAGA, Guér.)
(*coryli*, Brit. Cat.)
- II. Mandibles with four teeth, of which the two middle ones are long and rather large ; frontal tubercles ill-defined, hardly as large as the circular borders round the base of the antennæ ; size smaller.

i. Elytra with rather strong rows of punctures on the anterior portion of disc, which become feebler behind, upper surface thickly alutaceous ; suture of elytra, as a rule, foveate before apex

H. OLERACEA, L.

ii. Elytra with confused and more or less shallow punctures, not thickly, and exceedingly delicately, alutaceous ; suture of elytra, as a rule, not foveate before apex.

1. Elytra with rather large but shallow punctures, shoulders rather strongly projecting; colour dark blue *H. PALUSTRIS*, Weise.
2. Elytra with small and exceedingly shallow punctures, shoulders scarcely projecting; colour blue or greenish-blue *H. PUSILLA*, Duft.
(*v. montana*, Duft.)

H. tamaricis, Schrank. (*hippophaës*, Aubé; *consobrina*, Duft., *nec* All. *et* Foudr.; *erucæ*, Steph. Ill. iv. 307, teste Weise). Subelongate, convex, cyaneous, rarely greenish-cyaneous, upper surface alutaceous and finely and often somewhat obsoletely punctured, rather dull, with a silky sheen; frontal tubercles elongate; thorax small, convex, scarcely narrowed in front, with the sides scarcely rounded and comparatively broadly margined, the anterior angles not or scarcely callose, and with a deep transverse furrow before base; elytra much broader than base of thorax, somewhat produced and rounded at apex, shoulders marked; Weise compares the species with *H. lythri*, but says that it is more slender than that species, and easily distinguished from it by the narrow frontal tubercles, the smaller and proportionally more broadly margined thorax, of which the transverse basal furrow is deeper, and the finely and obsoletely punctured elytra, of which the shoulders project rather widely beyond the base of the thorax; the male intromittent organ appears to be shaped much as in *H. pusilla*, forming at the apex a broad triangular point, and in this sex the last abdominal segment is smooth in the middle and slightly impressed at base and apex, or else has a shallow central furrow. L. $4\frac{1}{2}$ – $5\frac{1}{2}$ mm.

According to Weise, the species occurs on *Hippophaë rhamnoides* and *Myricaria germanica*; he records it from England, and there are specimens in Dr. Power's collection which I had referred to the species before I obtained Herr Reitter's confirmation of its identity; they are from Mr. Crotch without locality. I am rather of opinion that all the insects standing in our collections under *H. consobrina* ought to be referred to this species.

H. lythri, Aubé (*consobrina*, Brit. Cat. (?); *erucæ*, Duft.; *indigacea*, Steph.). Elongate oblong-oval, narrow in front and gradually and regularly widened until behind middle, broadly rounded behind in the female and gradually contracted and slightly produced in the male, of a deep blue or violaceous colour, elytra depressed, very finely but closely and distinctly alutaceous, comparatively dull; head scarcely punctured, with an impression on vertex and strong frontal tubercles, antennæ stout, dark, third joint a little longer than second; thorax about half as broad again as long, slightly rounded before middle, and narrowed in front, anterior angles projecting, slightly callose, obsoletely punctured and almost smooth on disc, more plainly punctured towards anterior angles; elytra only a little broader at base than thorax, with feeble humeral callosities, and fine and close punctuation, which is made up of larger and smaller punctures, interstices alutaceous; legs dark, metallic. L. $4\frac{1}{2}$ –6 mm.

Male with the first joint of the anterior tarsi dilated, almost as broad as the third joint, and with the last segment of the abdomen sparingly punctured and pubescent in middle, with a shallow impression which is deeper towards apex; the intromittent organ is subtruncate and rounded at apex, and is produced in the middle of the apical margin into a small point.

Marshy places; on *Epilobium*, and according to Weise on *Lythrum salicaria*; locally common; Esher, Snodland, Chatham, Southend, Cowley, Bearsted near Maidstone; Norfolk Fens; New Forest; Ryde; Glanvilles Wootton; Devon; Swansea; Barmouth; Knowle, near Birmingham; Hunts; not mentioned in Dr. Sharp's Scotch list, but recorded by Stephens from Edinburgh (it is, however, quite possible that the record applies to another species); Ireland, near Belfast.

Varieties of this species occur, not uncommonly, in which the elytra are obsoletely sulcate longitudinally, or are furnished with two or three sharply raised, and more or less distinct, costæ, which are sometimes interrupted.

H. ericeti, All. Oblong ovate, with the sides of the elytra subparallel until behind middle, and thence gradually narrowed to apex, upper surface greenish-blue, with the elytra more shining than in the preceding species; head with the vertex scarcely punctured, and furnished with a small impression, frontal tubercles distinct, antennæ dark, with the third joint twice as long as second; thorax transverse, with sides slightly rounded and narrowed in front, very finely punctured on disc, more plainly at sides and towards anterior angles, which project and are moderately callose; the transverse furrow before base is scarcely continued obliquely at each side as in *H. lythri*; elytra not much broader at base than thorax, with the humeral callosities not strongly marked, with the punctuation stronger than in the preceding species, but somewhat variable, and with the interstices of the elytra more finely alutaceous, so that the upper surface is more shining; legs dark, metallic. L. $4\frac{1}{2}$ –6 mm.

The male is said to be the *H. longicollis* of Allard; it differs in having the thorax only a quarter broader than long, and the transverse furrow before its base shorter; the thorax is extremely finely punctured, and the punctuation of the elytra, as a rule, is finer than in the female; this point, however, is variable; the basal joint of the anterior tarsi is strongly dilated triangularly; owing to the greater length of the thorax, the elytra appear to be comparatively short; the intromittent organ is shaped at apex as in *H. lythri*.

On heath (*Erica tetralix*, &c.); local; Wimbledon, Esher, Mickleham, Woking, Chobham; Hastings; New Forest; Bournemouth; Repton; Chat Moss; York (Crotch); Scotland, local, Solway and Moray districts; Ireland, near Waterford.

Herr Weise, in his table of species (l.c. p. 831), mentions this species as an inhabitant of Southern Europe, and gives no further description of it; on p. 845 he mentions the *Graptodera longicollis* of Allard as a variety of *H. oleracea*; Allard's *G. ericeti*, however (and Weise refers

the species to this author), is distinctly mentioned by him as found in France, and a specimen taken by Mr. Crotch, and given me by the late Archdeacon Hey, has been returned to me by M. Brisout as *H. ericeti*; I do not, however, feel satisfied as to the identity of *H. ericeti* and *H. longicollis*; according to Mr. Rye, the latter insect has not been found further south than Chat Moss.

(***H. ampelophaga***, Guér. (*consobrina*, Foudr., *nec* Brit. Cat.; *coryli*, Brit. Cat., *nec* All.?). Oblong ovate, moderately convex, of a bright metallic green colour, sometimes with a bluish reflection, shining; head with large frontal tubercles, antennæ dark, metallic; thorax about half as broad again as long, with the sides slightly rounded, but more so in the female than in the male, with the anterior angles callose and usually somewhat produced, very thickly and very finely punctured, the punctuation becoming more evident towards the anterior angles; elytra considerably broader at base than thorax, with the humeral callosities strongly pronounced, very finely alutaceous, shining, much more distinctly and strongly punctured than thorax, interstices very finely punctured; legs dark metallic. L. $4\frac{1}{2}$ –5 mm.

In the male the first joint of the anterior tarsi is about as broad as the third, and the centre of the last segment of the abdomen is smooth and flatly impressed with a central furrow; the intromittent organ is subtruncate and rounded at apex, and produced into a small point in the centre of its apical margin.

On young hazels; in woods and hedges; locally common; Darenth Wood, Chatham, Ashted, Birch Wood; St. Osyth, Essex; Hastings; New Forest; Lords Wood, Southampton; Glanvilles Wootton.

I have inserted this species doubtfully, but am of opinion that all our specimens must be referred to *H. oleracea*, a species which has been very imperfectly understood in England; specimens standing under the name of *H. ampelophaga* in Dr. Power's collection have been returned to me by Reitter as *H. oleracea*; the species occurs in Southern Europe, Syria, and Algeria, but is not found further north than the Tyrol and Southern France, and Weise (l.c. p. 836) is of opinion that Allard's record of its occurrence in England is probably erroneous.)

H. oleracea, L. (*pusilla*, All., *nec* Duft.). Rather elongate, convex, of an æneous green colour, but sometimes cœruleous or cyaneous (*v. lugubris*, Weise), finely alutaceous, moderately shining, with a somewhat silky appearance; head with the frontal tubercles small and flat, antennæ dark (in immature specimens more or less reddish); thorax rather convex, about half as broad again as long, scarcely rounded and subparallel at sides, obsoletely punctured, rather dull, anterior angles not much thickened and obliquely obtuse; elytra broader at base than thorax with small but distinct humeral callosities, very little rounded at sides, convex, delicately alutaceous, plainly and deeply punctured in

rows on the anterior half, much more feebly, and confusedly, punctured behind, usually with a fovea on suture before apex; legs dark, metallic. L. $3\frac{1}{2}$ – $4\frac{1}{5}$ mm.

In the male the last abdominal segment is furnished with a transverse fovea near its apical margin, and sometimes with a shallow central furrow; the apical margin of the intromittent organ is quite rounded.

According to Weise, this species occurs on species of *Epilobium* and *Brassica*, and also on *Oenothera biennis*; there is so much confusion between this and the next species that I cannot be sure of the localities given, but I believe that it is by no means uncommon; as before remarked, specimens standing under the name of *H. ampelophaga* in Dr. Power's collection have been returned to me by Herr Reitter as this species, and all the records given for the last-mentioned insect must probably be referred to *H. oleracea*.*

H. palustris, Weise. Suboval, rather short and broad, deep-blue or nigro-cæruleous, not very shining; frontal tubercles flat, terminated behind with a depression or punctured line; thorax scarcely half as broad again as long, rather convex, obsoletely punctured, with the anterior angles scarcely callose and subrotundate, basal transverse furrow not deep; elytra with rather coarse, but shallow, punctuation, humeral callosities small, but plainly prominent. L. $3\frac{3}{4}$ – $4\frac{1}{4}$ mm.

Male with the first tarsal joint widened, and the last segment of the abdomen with a narrow impunctate and bare central line; the intromittent organ, as in *H. pusilla*, is narrowed in front in almost straight lines and forms a large point, and the deep channelled middle stria on the under-side of the same is very broad.

In damp places; local; taken in some numbers by Dr. Power at Wimbledon, and marked by him as probably a new species; I have also received it from the South of England and from the Manchester district; I believe that it stands in most of our collections under the name of *H. helianthemis*; the punctuation will easily distinguish the species; in its dark blue colour it much resembles the *var. montana* of *H. pusilla*, with which it appears to be sometimes mixed.

H. pusilla, Duft. (*cognata*, Kuts.; *helianthemis*, All.). Oblong ovate, convex, of an obscure greenish-bronze or bluish colour, shining; head with small frontal tubercles, obsoletely separated behind by a line or punctured depression; thorax half as broad again as long, a little rounded at the sides, narrowed in front, with the anterior angles rounded and obtuse and slightly callose, rather convex on disc, thickly and extremely finely punctured, transverse furrow, as a rule, less strong than in *H. oleracea*; elytra at base only slightly broader than thorax, with a very small and not very distinct humeral callosity, gradually widened until behind middle, thickly and obsoletely punctured on disc, more plainly towards suture; in the male the last abdominal segment is flatly impressed in middle and impunctate, and the intromittent organ is narrowed in front in almost straight lines and forms a large point, the angles at the sides being rounded; Weise compares the species to a

* One of Dr. Power's specimens has been named for me by Herr Reitter as *v. nigra*.

miniature *H. lythri*, but in sculpture and colour it is widely different; it is much narrower at the shoulders, and less parallel-sided and more widened behind than *H. oleracea*, and is further distinguished by its more obsolete punctuation and correspondingly more shining appearance, the upper surface being hardly visibly alutaceous. L. 3-4 mm.

V. montana, a dark blue or blackish-blue form of the type.

On *Helianthemum guttatum*; also apparently on *Epilobium* and *Poterium muricatum*, &c.; according to the records, widely distributed throughout the greater part of the kingdom, but I cannot be sure of the identification; the variety is not uncommon in the London district.

I have taken considerable trouble over this genus, and have seen British specimens named by Continental authorities of all the species above mentioned with the exception of *H. ampelophaga*, which has usually been considered one of our most distinct species, but which appears to have been confused with *H. oleracea*, and has probably not occurred in Britain; the latter species has apparently been confounded with *H. pusilla*, and the *var. montana* of the latter with *H. palustris*; the two species, however, that have caused me most difficulty are *H. ericeti* and *H. lythri*, which, if the specimens named for me by M. Brisout and Herr Reitter have been correctly determined, are exceedingly closely allied, the relative differences in length between the second and third joints of the antennæ not being very obvious; Weise, however (l.c. p. 837), compares *H. ericeti* with *H. ampelophaga*, and says that it can only be distinguished by its longer and more parallel-sided body, which has the thorax on an even level with the elytra, the narrow shoulders, and the scarcely marked humeral callosities; *H. tamaricis* and *H. palustris* are very distinct; the former appears to have stood in our collections as *H. consobrina*, and the latter as *H. helianthemi*; *H. consobrina*, however, has been regarded by different authors as synonymous with *H. ampelophaga*, *H. lythri*, and *H. tamaricis*, and in other points of synonymy great confusion has arisen; careful dissections of the genital organs of the male, and in some cases of the mouth organs, will have to be made before we can with certainty determine how many species are really found in Britain; as far as I can judge, I should be inclined to reckon only five species as British, *H. oleracea* (shining green), *H. tamaricis* (dull dark blue and rather large), *H. lythri* (shining cœrulean blue, size larger, punctuation of elytra more evident), *H. pusilla* (shining cœrulean blue or greenish-blue, size smaller, punctuation of elytra finer, the *v. montana* being dark blue), and *H. palustris* (dark blue, elytra coarsely and shallowly punctured, size as in *H. pusilla*); we are said, however, to possess the *H. longicollis* of Allard, which is usually regarded as the male of *H. ericeti*, but I am not sure of the specimens I have seen, which appear to me rather to belong to *H. pusilla*.

HERMÆOPHAGA, Foudras.

Eight species only are contained in this genus, of which three are found in Europe, one of which also occurs in Algeria; the remainder have been described from Brazil, Peru, Puerto Rico, and Nagasaki; they are oval, convex insects, with the anterior coxal cavities open behind; the thorax has an obsolete transverse impression before base, bounded on each side by a short but distinct fold or impressed line; the maxillary palpi have the last joint elongate and acuminate at apex; the antennæ are rather broadly distant at base, and the tibiæ are furnished at apex with a distinct spur.

H. mercurialis, F. Short oval, subhemispherical, very convex, shining, of a deep cyaneous blue colour; head triangular with the frontal furrows gradually converging, antennæ dark with the base, except the upper surface of the first joint, red; thorax about twice as broad as long, about as broad at base as at apex, scarcely punctured, smooth and shining; elytra with very fine double punctuation, and traces of two somewhat stronger rows on disc towards base; the wings are absent or rudimentary; legs dark; the male has the fifth ventral segment of abdomen subtruncate at apex. L. 2-3 mm.

In woods and hedges; on *Mercurialis perennis*; locally common; Caterham, Mickleham, Darenth, Croydon, Birch Wood, Crohamhurst, Reigate, Chatham, West Wickham, Bearsted near Maidstone; Hastings; Isle of Wight; Glauvilles Wootton; Bristol; South Wales; it has not, apparently, occurred in the Midland districts or further north.

PHYLLOTRETA, Foudras.

In this genus the anterior coxal cavities are open behind; the thorax is truncate at base, and has the posterior angles obtuse or right angles; the pygidium is not channelled, and the posterior tibiæ are furnished on their exterior margin with a lateral keel, which is not produced as far as the knees; the elytra are either unicolorous or furnished with a longitudinal yellow band on each, which is variable in shape; the genus contains about eighty species, of which about a third have been described since 1876; they will, therefore, probably be found to be much more numerous than is at present supposed; they are very widely distributed throughout the world; about thirty occur in Europe, of which fourteen are found in Britain.

Several of the species belonging to this genus are exceedingly destructive to crops, especially turnips; among these *Phyllotreta nemorum*, the turnip-fly or turnip-flea, stands pre-eminent; *P. undulata*, *P. consobrina*, and *P. cruciferæ* are also very injurious to the same crop as well as to other cruciferous plants; for a full account of the ravages of *P. nemorum* the student is referred to Curtis' Farm Insects, chapter i., and plate A, on which the insect, together with its larva and

pupa, are beautifully figured; as an instance of the damage caused by this beetle, Curtis mentions that so long ago as 1786 the turnip crop destroyed in Devonshire alone was worth 100,000*l.*; the eggs are laid upon the under-side of the rough leaf of the turnip from April to September, and they hatch in ten or even in seven days; the larvæ, which are whitish grubs with the head and most of the upper surface of the prothorax black, feed between the two skins or cuticles of the leaf, and arrive at maturity in six days; they then bury in the earth, and in about a fortnight change to the perfect insect; it is obvious, therefore, that there are several broods in the year, and that they increase to an enormous extent; the chief injury that is caused by them is the destruction of the cotyledons or seed leaves, which is done by the perfect insect, and entirely destroys the crop; if once the plants can be got beyond a certain stage, the attacks of the beetles do not much affect them; the application of good manure and careful preparation of the soil is therefore of advantage, and some people recommend thick sowing; as the autumn-hatched beetles hibernate, and are the chief source of damage in spring, all clods, weeds, &c., that might be likely to harbour them should be carefully removed; in fact, clean farming is one of the greatest protections that can be adopted against insect pests; in cases of bad attack, rolling with a light roller has been found beneficial, as also has the use of freshly painted boards; these, if drawn over the turnips, catch large numbers; many dressings have also been recommended, the chief perhaps being "one bushel of gas-lime, fresh from the gas-house, one bushel of fresh lime from the kiln, six pounds of sulphur, and ten pounds of soot, well mixed together and ground to as fine a powder as possible; this should always be applied very early in the morning, when the dew is on the leaf, and if the fly continues troublesome the process should be repeated." (See Miss Ormerod's *Manual of Injurious Insects*, p. 151.)

In the *Entomologists' Monthly Magazine*, vol. xxiii. p. 92, the Rev. Theodore Wood mentions the fact that he has found *P. melana* (= *consobrina*), (which is, as a rule, by no means a common species,) very destructive to seedling cabbages, brocoli, kale, &c., in the Isle of Thanet; in fact, Cruciferæ generally seem to be liable to the attacks of various members of this genus, which, in spite of their minute size, are amongst the most injurious of all Coleoptera.

Our British species may be divided as follows: the distinctions, however, are in many cases more or less comparative, and are hard to express in words; a comparison with authentic types will be found far more satisfactory than any descriptions

I. Upper surface unicolorous.

- i. Upper surface bronze; fourth joint of antennæ in male very large, strongly inflated *P. NODICORNIS, Marsh.*
- ii. Upper surface black, bluish, or greenish; fourth joint of antennæ in male not, or slightly, inflated.

1. Antennæ unicolorous black.
 - A. Upper surface blue or greenish-blue, closely and very finely punctured *P. NIGRIPES*, *F.*
(*lepidii*, Koch.)
 - B. Upper surface black with bluish or greenish reflection, very closely but distinctly and comparatively strongly punctured *P. CONSOBRINA*, *Curt.*
(*melæna*, Ill.)
 2. Antennæ with the basal joints more or less distinctly reddish or ferruginous.
 - A. Elytra very finely, closely, and confusedly punctured *P. PUNCTULATA*, *Marsh.*
 - B. Elytra comparatively strongly punctured, the punctures being arranged in more or less distinct rows.
 - a. Upper surface deep black, without metallic reflection; thorax evidently more finely punctured than elytra *P. ATRA*, *F.*
 - b. Upper surface with metallic reflection; thorax nearly as strongly punctured as elytra *P. CRUCIFERÆ*, *Goeze.*
(*pæciloceras*, Com.)
- II. Upper surface black with yellow bands or patches on the elytra.
- i. Outer margin of yellow bands on elytra feebly or moderately emarginate.
 1. Upper surface depressed; thorax with a more or less distinct metallic reflection, which is sometimes marked and sometimes very faint.
 - A. Size smaller; yellow bands on elytra rather strongly curved inwards at base *P. VITTULA*, *Redt.*
 - B. Size larger; yellow bands on elytra scarcely, or very gradually, curved inwards at base.
 - a. Tibiæ red-yellow at base only *P. UNDULATA*, *Kuts.*
 - b. Tibiæ entirely red-yellow *P. NEMORUM*, *L.*
 2. Upper surface convex; thorax black, without metallic reflection *P. FLEXUOSA*, *Ill.*
 - ii. Outer margin of yellow bands on elytra very strongly emarginate.
 1. Legs, except posterior femora, reddish-yellow *P. OCHRIPES*, *Curt.*
 2. Legs mostly black.
 - A. Dark space between the yellow bands of elytra rectangular *P. SINUATA*, *Steph.*
 - B. Dark space between the yellow bands of elytra elongate-oval *P. TETRASTIGMA*, *Com.*
 - iii. Elytra with two yellow spots on each, rarely united by a narrow line; form short oval and convex; size small *P. EXCLAMATIONIS*, *Thunb.*
(*brassicæ*, F.)

P. nodicornis, Marsh. (*antennata*, Koch). Oblong, depressed, æneous or coppery, rarely with a greenish reflection; head with the vertex very finely punctured, almost smooth, antennæ long and moderately stout, black with the apex of the basal joints ferruginous; thorax transverse, but not strongly so, gradually rounded at the sides, very closely and rather distinctly punctured; elytra long, subparallel, sepa-

rately rounded at apex, not entirely covering pygidium, thickly and confusedly punctured, the punctuation being a little stronger than that of thorax; legs dark, knees and tarsi reddish. L. $2\frac{1}{2}$ – $2\frac{3}{4}$ mm.

Male with the fourth joint of the antennæ very strongly dilated, and the fifth evidently dilated, and with the last ventral segment depressed towards apex.

On *Reseda lutea* and *Senecio jacobæa*; local, but common where it occurs; Mickleham, Darenth, Shirley, Reigate, Caterham, Chatham, Maidstone, Aylsham, Headley Lane, &c.; Wicken Fen; Cromer; Brandon, Suffolk; Birchington; Margate; Portsmouth district; Isle of Wight; Glanvilles Wootton; Swansea; Ticknall Quarry, near Repton, Burton-on-Trent (W. Garneys).

P. nigripes, *F. (lepidii*, Koch). A rather long and flat species, of a distinct bluish or greenish-blue colour, with the thorax often slightly coppery; head between eyes diffusely and obsoletely punctured in six or eight irregular rows, antennæ black, similar in the sexes; thorax half as broad again as long, narrowed in front, thickly and very finely punctured; elytra long, separately rounded at apex, more finely punctured than in any of the allied species; legs black, sometimes partly pitchy. L. $2\frac{1}{5}$ – $2\frac{1}{2}$ mm.

On *Cruciferae*; locally common; London and southern districts, widely distributed; apparently rare in the Midlands, and not recorded from the northern counties; the only Scotch record is "Raehills, Rev. W. Little," Murray's Cat.; Ireland, Howth, Dublin, Waterford, and Belfast; the only record from the Midland counties of England that I know of is Needwood, near Burton-on-Trent (Rev. H. S. Gorham).

P. consobrina, Curt. (*melæna*, Ill. et auct. (pars)). This species is allied both to *P. punctulata* and *P. nigripes*; from the former it may be known by its stronger metallic reflection and especially by the unicolorous black antennæ, and from the latter it may be separated by its darker colour and evidently stronger punctuation, as well as by the fact that the male has the third, fourth, and fifth joints of the antennæ not strongly, but evidently, incrassate. L. 2– $2\frac{1}{2}$ mm.

Sandy and chalky places; on *Cruciferae*, &c.; as a rule, not common, but, as above stated, recorded by the Rev. T. Wood as doing great damage to seedling cabbages, brocoli, &c., at St. Peter's, Thanet; Mickleham; Birdbrook, Essex, in abundance (Power); Maidstone; West Wickham; Norfolk; Hastings; Southsea; New Forest; Isle of Wight; Seaton Down, Devon; Bristol; Henley; Repton (W. Garneys).

According to Weise (*Naturgesichte der Insecten Deutschlands*, vi. p. 885), the *H. melæna* of Stephens (Ill. iv. 298, Man. 292) must be referred in part to *P. procera*, Redt., a species not hitherto recorded as British; Stephens' description is so meagre that it is hard to say how this conclusion has been arrived at; it is, however, quite possible that the last-named insect may be British, although the probabilities seem rather against it, as it is usually found in Central and Southern Europe, and is very abundant in North Africa; it is rather narrow and depressed, obscurely æneous, with the antennæ, tibiæ and tarsi black, and may be known from *P. consobrina* by having the prosternum broader between

the anterior coxæ and the mesosternum a little longer than broad, whereas in *P. consobrina* the prosternum is strongly narrowed between the anterior coxæ, and the mesosternum is twice as long as broad; in the male, moreover, the fifth joint of the antennæ only is dilated, and the last ventral segment of the abdomen is impressed at apex with a small fovea.

P. punctulata, Marsh. (*area*, All.). A small species, of a unicolorous black colour with more or less distinct bronze reflection, which is often almost absent; the antennæ have the base ferruginous, with the exception of a portion of the first joint, which is dark; this point will at once distinguish it from the two preceding species, and from the two following it may be easily separated by its much finer and more confused punctuation. L. $1\frac{1}{2}$ –2 mm.

On Cruciferae; not common; Caterham, Mickleham, Cowley, Southend, &c.; Birdbrook, Essex; Ditchingham, Suffolk; Margate; Devon; Bristol; Swansea; Needwood, Staffordshire; Repton; Ireland, Rathkurby near Waterford (Power).

P. atra, Payk. Of a deep shining black colour, without metallic reflection, antennæ with the first four joints ferruginous, the base of the first and the apex of the fourth being brownish; thorax considerably broader than long, with sides rounded, thickly punctured, the punctuation being evidently finer than on elytra; elytra long, separately rounded at apex, rather strongly punctured, the punctures being arranged in rather distinct rows towards base; legs black, tarsi and knees lighter. L. $1\frac{3}{4}$ – $2\frac{1}{2}$ mm.

On Cruciferae; local; London district, generally distributed and common; Wicken Fen; Dover; Hastings; Portsmouth district; Isle of Wight; Devon; Barmouth; Llangollen; Knowle, near Birmingham; Manchester district; Ireland, near Waterford (Power).

P. cruciferae, Goeze (*pæciloceras*, Com.; *obscura*, Ill.). As a rule a little larger and broader than the preceding, which it very closely resembles; it may, however, be distinguished by the fact that the upper surface always has a greenish or bluish metallic reflection and by the more clear testaceous colour of the base of the antennæ; the thorax is nearly as strongly punctured as the elytra, and the punctures of the latter are disposed in more regular rows. L. $1\frac{3}{4}$ – $2\frac{3}{4}$ mm.

On Cruciferae; local, but not uncommon where it occurs; Lee, Dartford, Mickleham, Cowley, Croydon, Cowfold, Shee ness, Plumstead, Barking, &c.; Margate; Ramsgate; Hastings; Isle of Wight; Glanvilles Wootton; Bristol; Repton (W. Garneys); Scotland, Solway district, "Raehills, Rev. W. Little," Murray's Cat.

P. vittula, Redt. A small species, oblong-ovate, rather depressed, black with the thorax metallic greenish or coppery, and the elytra with a yellow longitudinal band on each, which is feebly emarginate on its outer margin, and on its inner side is somewhat strongly curved inwards at base; it is also abruptly truncated or emarginate at shoulders, owing to the black colour of the humeral callosity; head with the front and

vertex strongly punctured, antennæ black with the base testaceous; thorax rather strongly punctured; elytra subparallel until a little before apex, strongly punctured, the punctures being arranged in rows at base, and being finer and confused behind middle; legs black, with the apex of anterior femora, the knees of the intermediate and posterior pairs, the under-side of the tibiæ and the tarsi reddish. L. $1\frac{1}{3}$ – $1\frac{3}{4}$ mm.

On *Nasturtium amphibium* and other Cruciferae; local, but not uncommon in several districts; London district, generally distributed and common; Norfolk; Cambridge; Hastings; Pulborough, Sussex; Portsmouth district; Glanvilles Wootton; Repton; Manchester district, general; Scotland, very rare, Solway district.

P. undulata, Kuts. (*flexuosa*, Redt., *nec* Ill.). Oblong oval, depressed, black, shining, thorax with a slight æneous reflection, elytra with a longitudinal yellow band on each, which is broadly and shallowly emarginate on its outer side, and has the inner side almost straight until near apex, where it is abruptly curved inwards and narrowed; antennæ black, with base pitchy or ferruginous, first joint dark, except at apex; thorax rather thickly and strongly punctured; elytra distinctly punctured in rows, the punctuation becoming finer and more confused towards apex; legs black, tibiæ reddish at base. L. 2 – $2\frac{3}{4}$ mm.

Male with the fourth and fifth joints of the antennæ slightly thickened.

On Cruciferae, especially turnips; generally distributed and common in England, and probably Ireland; Mr. Bold has the following remark in his catalogue of the Insects of Northumberland and Durham (p. 104):—"This species, and not *P. nemorum*, is the 'turnip-fly' of our district. Its smaller size, and nearly black legs, readily separate it from the latter." Dr. Sharp's Scotch record, "rare, Solway and Tay districts," seems, therefore, rather strange.

P. nemorum, L. Larger on the average than the preceding, and less depressed; it may readily be known by having the tibiæ entirely reddish-yellow, or only slightly infusate, and by the lighter base of the antennæ; the yellow band on the elytra is slightly waved and not so straight on its inner side, and the male has the fourth joint of the antennæ somewhat strongly, and the fifth moderately, incrassate, and the sixth joint short. L. $2\frac{1}{2}$ – 3 mm.

On Cruciferae, especially turnips; generally distributed and far too common throughout the greater part of the kingdom; Mr. Bold, however, says that it is rare, according to his experience, in the Northumberland and Durham district. Dr. Sharp records it as very common in the south of Scotland.

P. flexuosa, Ill.; Kuts., *nec* Redt. (*fallax*, All.). Subovate, rather convex, black, shining, with the base of the antennæ and tibiæ obscurely ferruginous; thorax without metallic reflection, finely and rather thickly punctured; elytra with a longitudinal yellow band on each, which is almost straight on its inner side, and moderately deeply emarginate externally in a semi-oval; the black space on disc between the yellow bands is very broad and almost parallel-sided; the species rather closely resembles *P. tetrastigma*, but has the punctuation of the thorax and elytra closer, the punctures of the latter being arranged in more distinct lines. L. $2\frac{1}{2}$ – $2\frac{3}{4}$ mm.

On *Nasturtium* and other Cruciferae; rare; Scotland, Solway, Forth and Clyde districts; the species was introduced into the British list on the authority of one specimen from Mr. Wollaston's collection, without locality, named by M. Allard.

P. ochripes, Curt. (*excisa*, Redt.). Oval, convex, shining black, with the base of the antennae and the legs, except posterior femora which are black, reddish-testaceous; elytra with a longitudinal yellow band on each, enclosing a common oval black space on disc, their external margins being very deeply emarginate in middle; occasionally the bands are entirely divided; antennae stout, with the fifth joint much elongate, and strongly dilated in the male; thorax convex, with sides rounded, rather strongly punctured, especially at sides; elytra somewhat strongly punctured in front, and much more finely behind; legs somewhat variable in colour, usually as above, but sometimes more or less infusate. L. $2\frac{1}{2}$ – $2\frac{3}{4}$ mm.

On *Erysimum alliaria*, *Nasturtium amphibium*, and *Cardamine amara*; local; London district, common and generally distributed; Weybridge, Mickleham, Caterham, Shirley, Walton, Forest Hill, Highgate, Dulwich, St. Mary Cray, Sevenoaks, Chatham, Dartford, Maidstone, &c.; Rudham, Norfolk; Henley; Hastings; Powderham Marshes, Devon; Ockbrook, Derbyshire (from specimens taken in which locality it was first described by Curtis); Scarborough.

P. sinuata, Steph. Oblong oval, rather depressed, black, shining, with the base of the antennae and of the tibiae reddish, each elytron with a longitudinal yellow band; these bands are abruptly curved inwards towards the suture at base and apex, and enclose a common rectangular black space, a point which will at once distinguish the species; the outer margin of the bands is strongly emarginate in middle; head and thorax closely and subrugosely punctured, antennae rather short and stout; elytra distinctly punctured towards base, obsolete at apex. L. 2 – $2\frac{1}{2}$ mm.

Male with the fourth and fifth joints of the antennae dilated.

On *Raphanus raphanistrum* and other Cruciferae; rare; Chatham and Sheerness (Walker); Quy Fen, Cambridge (Power); Wicken Fen (Champion); Oxford; Hampshire; Swansea; Sutton and Knowle, near Birmingham (Blatch); Bretby Wood, Repton (Garneys); York; Liverpool. Ireland, Rathkurby, near Waterford (Power).

P. tetrastigma, Com. In general appearance this species much resembles *P. ochripes*, from which it may be at once known by its black legs, which have the apex of the tibiae alone reddish; from *P. sinuata* it may be distinguished by its larger size, and by not having the yellow bands on the elytra abruptly bent inward at base and apex, the space between them being elongate oval; occasionally the bands are divided, forming four patches; the antennae are rather long, and are pitchy or ferruginous at base; the thorax is not very closely and rather finely punctured, and the elytra are rather strongly and not closely punctured at base, the punctuation becoming obsolete towards apex; the antennae are simple in both sexes, and in the male the fifth ventral segment of the abdomen is furnished with a rather deep triangular fovea which almost reaches the base. L. $2\frac{1}{2}$ – $2\frac{3}{4}$ mm.

In damp places, by sweeping Cruciferae, especially *Nasturtium officinale* and *Cardamine amara*; local; Highgate, Horsell, Aylsham, Reigate, Maidstone; Windsor; Ditchingham, Suffolk; Hastings; Bretby Wood, Repton; Withington, Cheshire; Manchester and Liverpool district; Northumberland and Durham district; Scotland, rare, Solway and Tay districts; Ireland, Armagh (Johnson).

P. exclamationis, Thunb. (*brassicæ*, F.; *quadripustulata*, Payk.). A small, short, convex species, which resembles a small *Aphthona* or *Thyamis* rather than a *Phyllotreta*; oval, convex, black, shining, with two yellow patches on each elytron, which are variable in size and are rarely united by a narrower or broader yellow line; antennae testaceous, more or less fuscous towards apex; thorax convex, with sides strongly rounded, closely and rather finely punctured; elytra very convex, much broader than the base of thorax, thickly and somewhat strongly punctured; legs pitchy black, or black, with the tibiae and tarsi more or less reddish; the general colour of the legs, however, is variable. L. $1\frac{1}{4}$ – $1\frac{1}{2}$ mm.

Marshy places; on Cruciferae; local, but not uncommon in many districts, and widely distributed from the Midlands southwards; rarer further north; Northumberland and Durham district, not common, but has been taken in several localities; Scotland, very rare, Solway district; Ireland, near Dublin.

APHTHONA, Chevrolat.*

In this genus the forehead is impunctate and furnished with rather distinct lines and tubercles; the anterior coxal cavities are open behind; the thorax has no basal furrow; the pygidium is covered, and is channelled on its upper surface; the first joint of the posterior tarsi is three times shorter than the tibia, and the spur of the posterior tibiae is inserted at the outer side of the apical edge; the species vary very much in colour and considerably in size; about one hundred and fifteen are at present known, which are very widely distributed over the greater part of the world, and range from Kamtschatka to the Cape of Good Hope, South America, and the Australian region; a considerable number have recently been described from Central America, and it is probable that the genus will ultimately prove to be a very large one in point of numbers; about forty species occur in Europe, of which eight are found in Britain; these may be distinguished as follows:—

- I. Upper surface mostly testaceous or pale yellow.
 - i. Head testaceous, or ferruginous; size larger A. LUTESCENS, Gyll.
 - ii. Head black, size smaller A. NIGRICEPS, Redt.
- II. Upper surface dark, greenish, bluish, purplish or nigro-æneous.

* Just after the sheet containing the table of genera (p. 333) had gone to press, I discovered an error affecting this genus: on page 333, last line, "APHTHONA, Chevr." should be erased, and inserted on page 334, line 9, immediately under PHYLLOTRETA, Foudr., at the end of paragraph b*.

- i. Shoulders prominent; elytra at base considerably broader than thorax.
 - 1. Size larger; elytra with the interstices closely and rugosely punctured, comparatively dull, of a bright blue colour A. NONSTRIATA, Goeze.
(cærulea, Payk.)
 - 2. Size smaller; elytra with the interstices not, or scarcely, rugosely punctured, shining.
 - A. Thorax impunctate, or at most with very fine punctures towards base.
 - a. Elytra dark blue; anterior and intermediate femora pitchy towards base; size larger . . . A. VENUSTULA, Kuts.
(euphorbiæ, All.)
 - b. Elytra dark violet; anterior and intermediate femora unicolorous red; size smaller . . . A. ATRO-CÆRULEA, Steph.
(cyanella, Redt.)
 - B. Thorax thickly and very finely punctured; colour greenish, more rarely bluish; anterior and intermediate femora unicolorous red, very rarely darker towards base A. VIRESCENS, Foudr.
(hilaris, Steph.?)
- ii. Shoulders rounded; elytra at base not much broader than thorax.
 - 1. Thorax distinctly transverse; average size smaller . . . A. ATRATULA, All.
 - 2. Thorax subquadrate; average size larger . . . A. HERBIGRADA, Curt.

A. lutescens, Gyll. Subovate, moderately convex, shining, of a yellow-testaceous colour, with the head sometimes ferruginous, and the antennæ towards apex, the mouth parts, the apex of posterior femora, and the breast and abdomen, black; occasionally, however, the abdomen is more or less yellow, or entirely yellow; the suture of the elytra is usually dark in the middle; antennæ gradually thickened towards apex; thorax short, transverse, with sides distinctly rounded, very finely and obsoletely punctured, punctuation more distinct behind; elytra at base considerably broader than thorax, rounded together at apex, with the sutural angles almost acuminate, very finely and thickly punctured; legs clear testaceous with the apex of the posterior femora sharply, abruptly and not, as a rule, broadly black, a character that will distinguish it at once from one or two of the other Halticæ, which it resembles in general appearance. L. 2-2½ mm.

Marshy places; on *Comarum palustre*, *Lythrum salicaria*, &c.; local, but sometimes common where it occurs; Snodland (Kent), Esher, Maidstone; Henley; Wicken Fen; Holm Bush, Brighton; Portsmouth district; New Forest; Isle of Wight, near Brading; Lee Valley, Devon; Bretby Wood, Repton; Scotland, very local, Solway district; Ireland, near Belfast and Lough Neagh.

A. nigriceps, Redt. Much smaller than the preceding, from which it may further be known by being more convex and of a shorter oval form, as well as by the black head, the absence of a black patch at the apex of the posterior femora, and the more slender antennæ, which are not so dark towards apex; the general colour, also, is lighter; thorax transverse, rufo-testaceous, almost smooth; scutellum black; elytra pale

testaceous with the suture more or less pitchy black (the colour, however, never reaching base or apex), very finely and obsoletely punctured; breast and abdomen black; legs testaceous, posterior femora sometimes a little darker. L. $1\frac{1}{2}$ mm.

On *Geranium pratense* (*Crane's-bill*); extremely local; first taken by Mr. J. T. Harris, of Burton, at Eggington, on the banks of the Trent near Burton, and subsequently in profusion at the same place, at the end of August, by Mr. Harris, Mr. Rye, and Mr. W. Garneys; Dr. Power has taken it at Cowfold in the London district, and also met with it in profusion at Kircaldy, Scotland, at the end of August, 1869.

A. nonstriata, Goeze (*cœrulea*, Payk.; *pseudacori*, Marsh? *nec* Foudr.). Oblong-oval, convex, upper surface bright blue; head with the side-pieces of the forehead convex, antennæ pitchy black with the five basal joints (except base of the first) mostly testaceous; thorax transverse, with sides slightly rounded, very finely punctured, almost smooth, shining; elytra with the shoulders projecting, broadest behind middle, with irregular rows of thick and somewhat rugose punctuation, interstices plainly and rugosely punctured, so that the upper surface is somewhat dull; legs long, with the posterior femora dark, except at base, and the base of the anterior and intermediate femora and the tarsi often more or less infusate; in the descriptions given by several authors the anterior and intermediate femora are said to be entirely reddish-testaceous, but this is by no means always the case; under-side black. L. $2-3\frac{1}{4}$ mm.

Marshy places; on *Iris pseudacorus*; local, but common where it occurs; it appears to be very widely distributed throughout the greater part of the kingdom.

A. venustula, Kuts. (*euphorbiæ*, All.; *cyanella*, Foudr., *nec* Redt.). Short oval, convex, very shining, upper surface nigro-cœruleous, under-side black; head small with two rather distinct obtuse tubercles between eyes, antennæ reddish-testaceous, fuscous towards apex; thorax transverse, almost impunctate; elytra with the shoulders strongly projecting, much broader at base than thorax, with fine and not close punctuation, which is often somewhat obsolete, interstices almost smooth; legs reddish-testaceous with the posterior femora, and more or less of the anterior and intermediate femora dark. L. $1\frac{3}{4}-2\frac{1}{2}$ mm.

On *Euphorbia*, especially *Euphorbia amygdaloides* (Wood-spurge); locally common; London district, generally distributed; St. Peter's, Kent; Hastings; Portsmouth district; Isle of Wight, abundant about Ventnor at the end of April; Devon; Swansea; Gloucester; Bewdley Forest; Needwood, Staffordshire; Ireland, near Dublin.

A. atro-cœrulea, Steph. (*cyanella*, Redt., *nec* Foudr.). Ovate, short and rather broad, shining, black, elytra dark violaceous; head smooth between eyes, antennæ dark with base testaceous; thorax transverse, slightly narrowed in front, almost impunctate; elytra considerably broader at base than thorax, with the shoulders strongly marked, with rows of moderate punctures in front, which become confused

towards apex, interstices almost smooth; legs testaceous, posterior femora infusate. L. $1\frac{1}{4}$ – $1\frac{1}{2}$ mm.

By sweeping herbage; often found in hay-stack refuse, moss, &c.; according to Weise, it occurs on species of *Euphorbia*, especially *E. esula*, a plant that is probably not indigenous to Britain, but which has established itself in a few localities on the banks of the Tweed, and in a few localities in Southern Scotland; locally common; London district, generally distributed; Hastings; Dorchester; Hayling Island; Bristol; Llangollen; Wicken Fen; Hertford; Knowle, near Birmingham; Northumberland and Durham district, Sunderland, Hartlepool, Wallington, &c.; Scotland, Solway district.

A. virescens, Foudr. (*hilaris*, Steph. ? *euphorbiæ*, Schrank, Gyll., teste Weise). Oblong oval, upper surface æneous-green, rarely bluish, shining, under-side black; head finely wrinkled transversely, antennæ fuscous testaceous towards base; thorax broader than long, slightly dilated in the middle of sides, with fine and close punctuation which is plainer at sides than on disc; elytra with the shoulders very prominent, much broader at base than thorax, a little dilated behind, and separately rounded at apex, with rather distinct punctuation, interstices smooth; legs testaceous, posterior femora dark. L. $1\frac{1}{2}$ –2 mm.

Marshy places; by sweeping low plants; local, but not uncommon where it occurs; Mickleham, Birdbrook, Maidstone; Ditchingham, Suffolk; Deal; Folkestone; Hastings; Seaton Down, Devon; Leigh Woods, Bristol; Cotswold Hills; Wicken Fen, Cambridge; Hunstanton, Norfolk; Matlock; Ireland, near Waterford (Power): according to Weise, it occurs on *Euphorbia cyparissias*, *Beta vulgaris*, and *Linum usitatissimum*, and extends in range from North Africa to Siberia.

There is some doubt as to the name that ought to be applied to this insect; it does not answer to Stephens' description (Ill. iv. 316), who describes his insect as "very black;" I have provisionally adopted Foudras' name, which is a description in itself, and avoids confusion, as there is considerable doubt also as regards what is the true *A. euphorbiæ*.

A. atratula, All. Oblong-ovate, rather narrow, black, shining; head rather broad, smooth; antennæ with the first six joints and the base of the seventh reddish-yellow, and the rest black; the fifth to the tenth joints are somewhat dilated at apex; thorax distinctly transverse, moderately convex, with the sides slightly rounded, finely and rather closely punctured; elytra scarcely broader at base than thorax, with the shoulders rounded, strongly and rather closely punctured, separately rounded at apex; legs ferruginous testaceous, posterior femora black; the upper surface appears often to have a slight metallic reflection. L. $1\frac{1}{4}$ – $1\frac{5}{8}$ mm.

Chalky places; by sweeping *Teucrium*, *Helianthemum*, &c.; very local; London district, common, Caterham, Mickleham, Croydon, Reigate, Warlingham, Sevenoaks, Chatham; Margate; Dover; Swanage; Ireland, Rathkurby near Waterford (Power).

A. herbigrada, Curt. (*campanulæ*, Redt.). Oblong-ovate, rather narrow and elongate, of an æneous-green colour, more rarely bluish or bronze,

under-side black; head large, with vertex very finely cross-striated, antennæ almost entirely testaceous, with the last three or four joints slightly infusate, and joints five to ten not dilated at apex as in *A. atratula*; thorax subquadrate, comparatively strongly and rugosely, but variably, punctured; elytra with shoulders rounded, not much broader at base than thorax, closely and rather strongly punctured, separately rounded at apex; legs yellow-testaceous, posterior femora often more or less infusate, first joint of the posterior tarsi shorter than in the preceding species, from which this insect may easily be known by its green colour and subquadrate thorax. L. $1\frac{1}{2}$ – $1\frac{3}{4}$ mm.

V. lævicollis, Rey. In this variety the thorax is almost smooth or very finely punctured, the punctuation being a little more distinct at base.

Chalky places; by sweeping herbage; very local; not uncommon in the London and South-eastern district, Caterham, Mickleham, Purley Downs, Reigate, Maidstone, Chatham; Dover; Devon; the only other record I know of is Scotland, Solway district, "Stichell Linn (R. Hislop)."

BATOPHILA, Foudras.

Only five species are contained in this genus, all of which are found in Europe; they are very small insects of dark, usually metallic, colour, and are distinguished by the absence of transverse or longitudinal impressions at the base of the thorax, which is not margined; the posterior tibiæ are furnished with a distinct spur, and the elytra are punctured in rather strong rows which reach to apex; Thomson places this genus in the section with the anterior coxal cavities closed behind, but they are evidently open.

I. Upper surface black, not or scarcely metallic; average size

larger B. RUBI, Payk.

II. Upper surface bronze, strongly metallic; average size

smaller B. ÆRATA, Marsh.

B. rubi, Payk. Ovate, very convex, black, shining, with the elytra often presenting a slightly bronzed reflection; head very finely sculptured, projecting considerably beyond base of antennæ, which are approximate at base and are red, often slightly infusate at apex; thorax not strongly transverse, convex, rounded at the sides, with the punctuation variable, being sometimes closer and stronger, sometimes more diffuse and finer; there are no traces of a transverse impression or longitudinal folds before base; elytra ovate, convex, with shoulders rounded and with strong rows of punctures, which are continued to apex; legs red, posterior femora infusate at apex. L. $1\frac{1}{2}$ –2 mm.

On *Rubus*, and also on low plants, in woods, hedge-rows, &c.; local; London district, common, Caterham, Shirley, Reigate, Mickleham, Birdbrook, Cowfold, Wimbledon, Purley Downs, Chatham, Maidstone; Dover; Hastings; Glanvilles Wootton; Devon; South Wales; Llangollen; Salford Priors; Knowle, near Birmingham; Findern, near Repton; Langworth Wood, Lincoln; Northumberland and Durham district; not recorded from Scotland; Ireland, near Dublin.

B. ærata, Marsh. Smaller than the preceding, and not so regular in outline, the thorax being evidently narrower than the elytra; it is also more depressed and rather narrower, and may be known by its bronze colour and the stronger punctuation of the sides of the head; the rows of punctures on the elytra, moreover, are finer, and the punctures are set more closely together. L. $1\frac{1}{4}$ – $1\frac{3}{4}$ mm.

On *Rubus*, hawthorn, and low plants; on chalky hill-sides in woods, &c.; locally common; London district, Kent, Surrey, and south coast generally distributed; very abundant in the Isle of Wight at the end of April and beginning of May, and found on almost every hawthorn hedge and bush in the south of the island; Henley; Hereford (Blatch); Findern, near Repton (Garneys); Northumberland and Durham district, "Hetton Hall, near Belford" (W. B. Boyd); I feel, however, somewhat doubtful as to the latter record.

SPHÆRODERMA, Stephens.

In its subhemispherical convex form this genus resembles *Apteropeda*, but may at once be known by having the elytra confusedly punctured; the mouth parts, moreover, are covered, or almost covered, by the prosternum, the posterior tibiæ are not denticulate externally, and the spur at their apex is absent or obsolete; our species are entirely rufo-testaceous; the total number of species at present known is about forty, which are very widely distributed, representatives occurring in India, Japan, Ceylon, Africa, the Malay Archipelago, North and South America, the Australian region, &c.; three only inhabit Europe, of which two are found in Britain; they are very closely allied, but may be distinguished as follows:—

- | | |
|--|------------------|
| I. Average size larger; form more hemispherical; tibiæ slightly curved | S. TESTACEUM, F. |
| II. Average size smaller; form a little more oblong; tibiæ almost straight | S. CARDUI, Gyll. |

S. testaceum, F. (*centaureæ*, W. C.). Subhemispherical, shining, entirely rufo-testaceous, except the eyes, which are black; head small with distinct frontal tubercles, vertex scarcely punctured, antennæ long, very gradually and slightly thickened towards apex; thorax very transverse, gradually narrowed in front, sometimes very obsoletely and scarcely visibly punctured, sometimes distinctly punctured; elytra with the shoulders rounded, but slightly marked, sparingly and very finely punctured, the punctures towards the sides being arranged in more or less distinct rows. L. $2\frac{3}{4}$ –4 mm.

On thistles, &c.; common and generally distributed throughout the kingdom.

S. cardui, Gyll. (*testacea*, W. C.). Extremely closely allied to the preceding, but not quite so round, and a little more oblong; the thorax is a little less compressed at apex, and has the sides less rounded and the anterior angles more prominent, and in the male the first joint of the

tarsi is more strongly dilated; the average size is a little smaller; the punctuation of the thorax is, as a rule, stronger, but this character cannot be depended upon, as it is very variable in specimens belonging to the same species; the femora are rather stouter than in *S. testacea*, and the tibiæ are almost straight. L. $2\frac{3}{4}$ – $3\frac{1}{2}$ mm.

On thistles, *Centaurea nigra* (Knapweed), &c.; less common than the preceding, but very widely distributed throughout the greater part of the kingdom, especially near or not far from the coast; both the species appear to be less common far inland.

APTEROPEDA, Redtenbacher.

The species belonging to this genus may be at once known by their subglobose, almost hemispherical form, and dark and more or less metallic colour; the mouth parts are free and not covered by the prosternum, and the elytra are punctured in rows; the legs are moderately long, and the posterior tibiæ are deeply channelled above, and more or less distinctly dentate or pectinate externally towards apex, and are furnished with a strong spur at apex; only five species appear to have been described, of which four are found in Europe, and the fifth in Asia; three occur in Britain; they are very closely allied, and are somewhat hard to distinguish.

- I. Interstices of elytra very finely, but distinctly punctured; upper surface usually bright bronze, strongly metallic *A. ORBICULATA*, Marsh.
(*graminis*, Koch.)
- II. Interstices of elytra scarcely punctured; upper surface scarcely, or not strongly, metallic.
 - i. Thorax finely but thickly and distinctly punctured; colour pitchy black, with a slight metallic reflection *A. GLOBOSA*, Ill.
 - ii. Thorax very finely punctured, almost smooth; colour bluish-black *A. SPLENDIDA*, All.

A. orbiculata, Marsh. (*graminis*, Koch; *ciliata*, Ol.). Ovate-hemispherical, gibbose, of a bright bronze or greenish-bronze metallic colour, rarely bluish, under-side nigro-æneous; head distinctly punctured, antennæ rather short and stout, ferruginous, often infusate towards apex; thorax twice as broad as long, narrowed in front, not margined at base, covered with fine and rather closely set punctures; elytra with distinct and regular rows of rather fine punctures, interstices broad and even, very finely, but plainly, punctured; legs ferruginous, posterior femora dark metallic, anterior and intermediate femora more or less infusate. L. $2\frac{1}{2}$ –3 mm.

On grass and low plants; often found in moss; common and generally distributed throughout England; Scotland, Solway and Clyde districts; Ireland, Portmarnock and Armagh, and probably common.

A. globosa, Ill. (*globus*, Duft.; *majuscula*, Foudr.). Closely allied to the preceding in form and general appearance, but rather larger, and of a dark nigro-æneous colour, scarcely metallic; the interstices of the

elytra are also evidently less punctured; the punctuation of the thorax also is not so close, and the punctures are a little stronger at the sides; the legs are somewhat darker. L. $2\frac{3}{4}$ – $3\frac{1}{2}$ mm.

In moss; rare; Caterham (Champion); Portsdown Hill, near Portsmouth (Moncreaff); Hunstanton, Norfolk (Blatch); Bretby Wood, near Repton, Burton-on-Trent (Garneys); Ripon (Waterhouse); Scarborough (Lawson); Bollin Valley, Cheshire (Chappell); Ireland, near Armagh, rare (Johnson).

A. splendida, All. (*globosa*, Foudr., *nec* Ill.). Of the size and shape of *A. orbicularis*, to which it is closely allied; the colour, however, is bluish-black, and the thorax is much less strongly punctured, the punctures being very scattered and obsolete; the interstices of the elytra are also almost smooth; the colour and the punctuation of the thorax will separate it from *A. globosa*; the mouth is ferruginous, and the antennæ entirely testaceous, their joints being thicker than in *A. orbiculata*; the posterior tibiæ are not dentate, but finely pectinate externally and ciliate at apex; in the other two species they are dentate. L. $2\frac{1}{2}$ –3 mm.

Very rare; Whalley, Lancashire, August 4th–7th, 1858 (Power); also received by Dr. Power from Mr. Hardy, Manchester; Mr. Blatch also records it from Hunstanton, Norfolk.

MNIOPHILA, Stephens.

Only three species are contained in this genus, two of which are found in Europe and one in Ceylon; they are very small, strongly convex, and gibbose insects, and may be distinguished by having the three apical joints of the antennæ enlarged and forming a club; the head is sunk in the thorax, and the forehead is marked with two deep furrows which cross one another and form an X; the thorax is transverse, and the elytra are produced into a deflexed point at apex; the posterior femora are only moderately thickened, and in consequence the power of leaping is much less developed than in many of the other genera; the spur at apex of posterior femora is obsolete or wanting.

M. muscorum, Koch. Ovate, globose, very shining, upper surface black with a bronze reflection, under-side pitchy, more or less metallic; head finely alutaceous, antennæ red; thorax transverse, with the sides scarcely rounded, not margined at base, almost impunctate; elytra gibbose, broader than thorax, rounded at shoulders, with sutural apical angle mucronate, almost smooth at apex, but with regular rows of fine but distinct punctures towards base; legs red. L. $\frac{2}{3}$ –1 mm.

In moss, on stumps of trees, chalky banks, at the side of water-courses in woods, &c.; very local, but common where it occurs; Birch Wood, Chatham, Faversham, Westerham, Highgate, Darenth, The Holt, Farnham; Weymouth; Stonehouse, near Gloucester; Bewdley; Langworth Wood, Lincoln; Ripon; Scarborough; Northumberland and Durham district; Scotland, Solway and Tweed districts; the species is usually found in the winter, especially in November and December.

PODAGRICA, Foudras.

This genus contains about twenty species, seven of which are found in Europe, and the remainder have been described from Morocco, Madagascar, Syria, North and South America, Java, New Guinea, &c., so that the genus is probably much more extensive than is at present known; the species are characterized by having the anterior coxal cavities closed behind, the last joint of the maxillary palpi elongate, and the thorax narrowly impressed at extreme base just before margin, and with an obsolete fold on each side; there is, however, no impression before base as in several genera; our species may be known from all our other Halticidæ except *Crepidodera rufipes* by their bright red thorax, and the last-mentioned species may easily be distinguished from them by the strong transverse impression and folds before base of thorax.

- I. Punctures of elytra coarser and arranged in more distinct rows; legs dark; average size smaller *P. FUSCIPES*, L.
 II. Punctures of elytra finer and arranged in confused rows; legs red; average size larger *P. FUSCICORNIS*, L.

P. fuscipes, L. Oblong, rather convex, shining, head and thorax red, elytra dark greenish-æneous, sometimes bluish or violaceous; head with vertex almost smooth, antennæ pitchy black with the base red, the upper surface of the first joint being often dark; thorax very transverse, twice as broad as long, nearly as broad in front as behind, diffusely and finely punctured, the punctuation consisting of larger and smaller punctures intermingled; elytra with moderately regular rows of rather strong punctures, which become confused and much finer towards apex, interstices very finely punctured, shining; legs black or pitchy black, with the joints usually lighter. L. $2\frac{1}{2}$ – $3\frac{1}{2}$ mm.

On mallows; London district, Kent and Surrey, generally distributed and sometimes abundant; Pegwell Bay; Dover; Rye; Brighton; Portsmouth district; Isle of Wight; Weymouth; Glanvilles Wootton; Devon; Weston-super-Mare; South Wales; Huntingdonshire; the only record further north, "Scotland, Dumfriesshire, Rev. W. Little," Murray's Cat., is probably in error.

P. fuscicornis, L. Larger, on an average, than the preceding, and easily distinguished by its red legs and the fine rows of punctures on elytra, which are more or less confused and arranged in indistinct double series, the interstices being closely and very finely punctured and rather dull; the thorax is also more finely punctured, and the elytra are always cyaneous or violaceous, occasionally greenish, but never nigro-æneous. L. 3–4 mm.

On mallows; common and generally distributed in the London district, Kent and Surrey; Dover; Hastings; Devon; South Wales; Stephens records it from near Carlisle, but I have no further record from any place north of Hunstanton, Norfolk, where I have found it plentifully in August.

MANTURA, Stephens. (*Balanomorpha*, Foudras.)

This genus may be distinguished by having the thorax at base as

broad as the elytra, without a trace of a transverse impression at base, but with a distinct longitudinal fold or impression on each side; the antennæ are rather short and stout, and thickened towards apex; the elytra are punctured in regular or almost regular rows; all the tibiæ are furnished with a distinct spur; the form is elongate-oval and almost subcylindrical, and the colour is variable, but, as a rule, dark blue or greenish-blue; about a dozen species are known, half of which are found in Europe, and others have been described from North America, Algeria, and Adelaide; four of them inhabit Britain.

- I. Upper surface dark blue or greenish-blue, with the apex at least of the elytra ferruginous M. RUSTICA, L.
- II. Upper surface entirely æneous or ferrugino-æneous. M. CHRYSANTHEMI, Koch.
- III. Upper surface dark blue or greenish-blue, unicolorous.
 - i. Thorax dull; elytra with broad interstices, the last of which has no row of larger punctures on its basal half; size larger M. OBTUSATA, Gyll.
 - ii. Thorax shining; elytra with narrow interstices, the last of which has a distinct row of larger punctures on its basal half; size smaller M. MATTHEWSI, Curt.

M. rustica, L. (*semicænea*, F.). Oblong-oval, rather elongate, moderately convex and shining, head and thorax obscure brassy-green, elytra dark blue or bluish-black, more or less broadly ferruginous at apex; head rather strongly punctured, antennæ with the base red, except upper surface of first joint, and the rest dark; thorax about half as broad again as long, narrowed in front, rather strongly punctured, but usually diffusely on disc; elytra long with regular rows of strong punctures, which are continued to apex, where, however, they become finer; legs ferruginous or pitchy red, with the posterior femora dark, and the tarsi infusate. L. $2\frac{1}{4}$ –3 mm.

V. suturalis, Weise. This variety has the elytra entirely ferruginous, with the suture greenish or bluish.

By sweeping herbage (*Rumex*, &c.); usually in damp places; occasionally found in hay-stack and vegetable refuse; generally distributed throughout England; it appears, however, to be local in some districts, and to become less common further north; Scotland, not common, Solway district; it is probably widely distributed in Ireland.

M. chrysanthemi, Koch. Oblong-ovate, shorter, more oval and more convex than the preceding species, from which it may be at once known by having the upper surface entirely of a bright æneous, sometimes coppery, colour, the apex of the elytra being ferruginous; the shape of the head, antennæ, and thorax is much as in the preceding species; the latter, however, is more finely and closely punctured; the striæ of the elytra are strong and regular, and are continued to apex; under-side black, with bronze reflection, very finely punctured; legs red, posterior femora ferruginous or pitchy ferruginous. L. $1\frac{3}{4}$ – $2\frac{3}{4}$ mm.

V. Crotchi, All. This variety has the elytra ferruginous and slightly æneous, with the suture brownish; it is probably immature.

On *Chrysanthemum leucanthemum* (Ox-eye Daisy); rare; Ashwicken, near Cambridge (Power); Stretton Moss, Cheshire (Matthews); Chat Moss (Reston and Chappell); Douglas, Isle of Man (Chappell); Stephens records it from the London district, Bristol, and Raehills near Edinburgh, but it is not in Dr. Sharp's Scotch list. I have lately received a specimen taken by the Rev. W. Johnson at Vicars Cairn, co. Armagh, Ireland.

M. obtusata, Gyll. This species very much resembles *M. rustica*, but is more convex, and of a unicolorous dark blue colour, with the thorax much duller, the spaces between the punctures, which are distinct, being strongly cross reticulated, a point that will easily distinguish the species; the elytra are very convex with rows of rather strong but not deep punctures, which usually become obsolete or very feeble at apex, and the interstices are broad, plainly cross reticulated under a high power, but not so dull as those of the thorax; antennæ and legs much as in *M. rustica*, anterior femora sometimes pitchy. L. $2\frac{1}{4}$ – $2\frac{3}{4}$ mm.

Marshy places; by sweeping herbage (*Helianthemum vulgare*, &c.), also in moss and at roots of grass; local, and, as a rule, rare, but widely distributed, Horsell, Ripley, Ashted, Cowfold, Cowley, Tilgate; Hollingbourne and Snodland, Kent; Maidstone; Norfolk; Suffolk; Cambridge Fens, Quy Fen, &c.; Windsor; The Holt, Farnham; Glanvilles Wootton; Bristol; Welshpool; Repton; Ockbrook, Derbyshire; Bollin Valley and Bowdon, Cheshire; Heysham, near Lancaster; Ripon; Scarborough; Scotland, local, Solway, Tweed, and Forth districts.

M. Matthewsi, Curt. (*ærar*ia, Foudr.). Oblong-ovate, strongly convex, shining, of a dark æneous green or bluish-green colour; occasionally the thorax is greenish and the elytra blue; thorax more thickly and finely punctured than in either of the other species; elytra with moderately strong rows of punctures, which are continued to apex where they become finer, interstices narrow, very finely alutaceous, but shining; legs red, posterior femora dark, metallic, anterior and intermediate femora and tarsi infusate; the closer punctuation, more shining thorax, and the much narrower and more shining interstices of elytra, as well as the smaller size, will easily separate this species from the preceding. L. $1\frac{3}{4}$ – $2\frac{1}{4}$ mm.

In chalky places; on *Helianthemum vulgare*; very local; Reigate, Croydon, Mickleham, Caterham, Kenley, Chatham, Faversham, Maidstone, Easry; Folkestone; Cambridge; Matlock (Blatch); it occurs in abundance in some localities in the London district, but I know of no record further north than Matlock, nor has it occurred in any of the western districts.

OCHROSIS, Foudras.

This genus is distinguished from *Crepidodera* and its allies, with which it has usually been included, by having no transverse impression

or longitudinal folds at base, and from *Batophila*, which it resembles in this respect, by having the thorax margined at base; the posterior coxæ are rather broadly distant at base, and the punctuation of the elytra is obsolete at apex. Weise (l.c. p. 706) mentions five European species as belonging to the genus, but one of these, *O. (Crepidodera) ventralis*, can hardly be included under it (v. foot-note, p. 334).

***O. salicariæ*, Payk.** Oval, convex, rather shining, rufo-testaceous with the breast and abdomen black; the antennæ are slightly infusate towards apex, and the suture of the elytra is very narrowly ferruginous; head thickly punctured, thorax scarcely twice as broad as long, very finely punctured, without a trace of a transverse impression or longitudinal fold at base, a point that will separate it from *Crepidodera ventralis*, which it closely resembles; elytra broader at base than thorax, with the shoulders well marked, punctured in moderate rows, which become obsolete towards apex. L. $2-2\frac{1}{4}$ mm.

Marshy places; on *Lythrum salicaria* and *Hypericum quadrangulum*; local; Woking; Mickleham; Norfolk; Ditchingham, Suffolk; Wicken Fen, in May and June; New Forest; Bristol; Bretby Wood, Repton; Heysham, near Lancaster; Ireland, Carlingford, co. Louth (Johnson).

CREPIDODERA, Chevrolat.

This genus in its wider sense (excluding, however, the now universally received genus *Epitrix*) contains about one hundred and ten species, which are widely distributed in Europe, Northern Asia, Africa, and North Central and South America; one species, also, has recently been described from Australia, so that ultimately the genus will probably prove to be a very extensive one; of the thirty European species, nine are found in Britain; they are oval or oblong-oval insects, very variable in colour, and may be known by the transverse impression at the base of the thorax, which is bounded on either side by a raised fold, taken in conjunction with the closed anterior coxal cavities, and the fact that the coxæ are only slightly distant; the elytra are punctured in rows, which, as a rule, are strongly marked; the frontal keel is usually sharply raised; the posterior femora are rather long and only moderately dilated, so that several of the larger species have the power of leaping less developed than is the case with some members of the tribe, and there is no apparent spine at the apex of the tibiæ. In the male the first joint of the anterior tarsi is, usually, more or less dilated, and the fifth ventral segment of the abdomen is truncate or subtruncate at apex. Foudras and Weise have divided the genus into several separate genera on the formation of the frontal tubercles, the shape of the last joint of the maxillary palpi, the pubescence, &c.; of these I have adopted *Hippuriphila*, *Ochrosis* and *Epitrix*, and have included the others under *Crepidodera*.

- I. Upper surface, at all events of thorax, not metallic, last joint of maxillary palpi short and thick.
 - i. Upper and under surface ferruginous-testaceous.
 1. Rows of punctures on elytra in irregular rows, which are double in the female; size larger *C. TRANSVERSA*, Marsh.
 2. Rows of punctures on elytra in regular single rows; size smaller *C. FERRUGINEA*, Scop.
 - ii. Under-side, in part at least, black.
 1. Thorax red; elytra black or bronze-black; frontal tubercles very distinct (s.g. *Derocrepis*, Weise) *C. RUFIPES*, L.
 2. Upper surface light testaceous; frontal tubercles indistinct *C. VENTRALIS*, Ill.
- II. Upper surface strongly and brightly metallic; last joint of maxillary palpi slender, longer than the penultimate (s.g. *Chalcoides*, Foudr.).
 - i. Interstices of elytra somewhat strongly punctured in more or less distinct rows *C. NITIDULA*, L.
 - ii. Interstices of elytra very finely punctured or slightly rugose.
 1. Thorax with the interstices almost smooth or very finely punctured.
 - A. Antennæ entirely reddish-testaceous, or slightly fuscous towards apex; size larger *C. HELXINES*, L.
 - B. Antennæ black with base reddish-testaceous; size smaller.
 - a. Antennæ with the first four joints sharply reddish-testaceous and the remainder black; thorax and elytra usually concolorous; elytra subparallel *C. CHLORIS*, Foudr.
 - b. Antennæ with the first five joints, and sometimes part of the sixth reddish-testaceous; thorax usually bright red and elytra green; sides of elytra somewhat rounded *C. AURATA*, Marsh.
 2. Thorax with the interstices rugose; colour brilliant golden green, unicolorous *C. SMARAGDINA*, Foudr.

C. transversa, Marsh. (*impressa*, Duft., *nec* F.; *exoleta*, Ol., *nec* F.; *ferruginea*, Ill., *nec* Scop.). The largest of our species; oblong-ovate, convex, entirely ferruginous testaceous, except the eyes which are black; head extremely finely punctured, antennæ sometimes a little darker towards apex; thorax more or less transverse, broadest before middle, narrowed behind, diffusely and finely punctured, with a strong transverse furrow at base, bounded by a distinct longitudinal fold on each side; elytra with irregular rows of moderately strong punctures, interstices very finely punctured; posterior femora sometimes a little darkened in middle. L. 4–5 mm.

Male with the thorax scarcely transverse, and the rows of punctures on elytra almost simple; the last ventral segment of the abdomen, also, is deeply impressed transversely at apex.

Female with the rows of punctures on elytra double.

On thistles, rushes, and dry grass; usually in damp places; somewhat local, but, as a rule, common and generally distributed throughout the kingdom.

C. ferruginea, Scop., *nec* Ill. (*exoleta*, F., *nec* Ol.). Very closely

allied to the preceding, which it resembles in colour and general appearance; it is, however, smaller and distinctly more ovate, and may be easily known by the regular simple rows of strong punctures on the elytra; the thorax, also, is more finely punctured, and the anterior angles are less prominent; the male is smaller, and has the last ventral segment of the abdomen distinctly impressed transversely at base. L. 3-4 mm.

On *Urtica dioica*, also on reeds, dry grass, &c.; often found with the preceding; common and generally distributed throughout the kingdom.

C. rufipes, L. (*Derocrepis rufipes*, Weise). Oblong-ovate, convex, shining, with the head, antennæ, thorax and legs red, and the elytra dark, nigro-cœruleous, cyaneous, or greenish; abdomen and breast black; head scarcely punctured, thorax transverse, scarcely visibly punctured, broadest at or just behind middle, narrowed in front, with a distinct transverse furrow, bounded on each side by a strong transverse fold; elytra at base a little broader than thorax, with the shoulders marked, but rounded, punctured in rather strong and more or less regular rows, which are continued to apex; the posterior femora are sometimes darker in the middle. L. $2\frac{3}{4}$ - $3\frac{1}{4}$ mm.

On *Malva*, *Orobis*, and *Vicia*; generally distributed throughout England, but more local further north; Scotland, local, Solway, Forth, Dee, and probably other districts; Ireland, only recorded from near Belfast, but it most likely occurs in many other places.

C. ventralis, Ill. (*abdominalis*, Küst.; *nigriventris*, Bach.; *Ochrosis ventralis*, Weise). Ovate, not very convex, testaceous or rufo-testaceous, rather shining, with the breast and abdomen black, elytra lighter than thorax; head thickly and finely punctured, with a triangular smooth space between antennæ, antennæ more or less infusate towards apex; thorax almost twice as broad as long, with the sides almost straight, finely punctured, with an obsolete transverse impression at base, bounded on each side by a distinct longitudinal impression or fold; elytra depressed on disc, with shoulders marked, plainly broader at base than thorax, punctured finely in regular rows, which become obsolete towards apex which is nearly smooth; legs testaceous, femora sometimes darker in middle. L. 2- $2\frac{1}{2}$ mm.

Chalky and sandy places; by sweeping herbage; according to Weise, it occurs on *Solanum dulcamara*, but I have taken it in the Isle of Wight on *Matricaria*; it sometimes occurs in moss; local, but not uncommon where it occurs; St. Mary Cray, Chatham, Faversham, Mickleham, Birdbrook (Essex), Shirley, Woking; Warlingham; Shipley, near Horsham; St. Faith's, Norwich; Hastings; Sandown, Isle of Wight; Seaton, Devon; Llangollen; Bretby Wood, Repton; Heysham, near Lancaster; Ireland, near Waterford (Power).

This species closely resembles *Ochrosis salicariæ*, from which it may be known at once by the obsolete transverse impression and distinct longitudinal folds at base of thorax; it is also, as a rule, of a lighter colour than that insect, and has the elytra longer and more depressed.

C. nitidula, L. (*Chalcoides nitidula*, Foudr.). Oblong-ovate, rather convex, shining; head and thorax golden green or coppery, elytra nigro-cœruleous, violaceous, or greenish-blue; head with vertex very shining, scarcely punctured, antennæ reddish-testaceous, fuscous towards apex; thorax transverse, broadest before middle, rather thickly and distinctly punctured, with a strong transverse furrow at base bounded on each side by a longitudinal impression; scutellum dark blue; elytra at base a little broader than thorax, with shoulders marked, punctured in distinct and not very regular rows, with the interstices, especially the second, fourth, and sixth, furnished with rows of rather strong punctures; legs reddish-testaceous, posterior femora dark. L. $3-4\frac{1}{4}$ mm.

On willows and aspens; rare; near London and Bristol (Stephens); Littlington, Cambridge, one specimen, September, 1863 (Power); Dover (C. G. Hall); Devon (Parfitt); Knapps Wood, near Weston-on-the-Green, Oxfordshire (Matthews); Scotland, doubtful, the only record being "Raehills, Rev. W. Little," Murray's Cat. Mr. Johnson records it from Armagh, but I have not seen the specimens.

C. helxines, L. (*Chalcoides helxines*, Foudr.). Oblong-ovate, in shape much resembling the preceding, but easily distinguished, apart from its colour, by the stronger punctuation and the almost smooth interstices of the elytra; the colour is variable, being usually coppery red or æneous green, with the head and thorax, as a rule, almost unicolorous with elytra; occasionally the upper surface is cœruleous or cyaneous, but this variety is very rare; it is the *Chrysomela cyanea* of Marsham; head very finely punctured, antennæ entirely reddish-testaceous or gradually and slightly infusate towards apex; thorax strongly punctured, almost twice as broad as long, broadest before middle, with a strong transverse furrow and longitudinal impressions at base; elytra with rows of strong and deep punctures, interstices very finely punctured; legs reddish-testaceous, posterior femora dark. L. $3-3\frac{3}{4}$ mm.

On willows, sallows, and poplars; generally distributed and common in the London and South-eastern, and probably the whole southern districts of England; somewhat local in the Midlands; Swansea; Lincoln; Manchester district, general; Bold says that although stated to be very common in the Northumberland and Durham district on willows, yet he has never seen a local specimen, and Dr. Sharp records it with doubt from the Solway, Tweed, Forth, and Clyde districts of Scotland, and remarks that he has never seen a Scotch specimen of the sub-genus *Chalcoides* except *C. smaragdina*, to which insect, probably, the *C. helxines* of Murray's catalogue ought to be referred; Ireland, Dublin and Belfast. Weise (l.c. p. 717) regards *C. cyanea*, Marsh., as a distinct species.

C. chloris, Foudr. This species is of a unicolorous greenish-golden coppery colour, the coppery colour usually prevailing over the other tints, and may easily be known from the allied species by its oblong, subparallel, and more elongate form, and by having the first four joints of the antennæ of a bright reddish-yellow colour and the remainder black, the colour being sharply defined; the rows of punctures on the elytra are finer than in the preceding species. L. 2-3 mm.

On poplars, aspens, and willows; found on the leaves in summer, and beneath the bark in winter; locally common; Barnes, Putney, Weybridge, Peckham, Dulwich, Cowley, Sheerness, Snodland, Maidstone; Henley; Dover; Robins Wood, Repton; Mr. Blatch records it as generally distributed in the Midlands, but I have never met with it.

C. aurata, Marsh. (*versicolor*, Kuts.; *Chalcoides aurata*, Foudr.). This species is of about the same size as *C. chloris*, but has nearly the shape and sculpture of *C. helixines*, with which it has been considered identical by some authors; it is, however, less ovate, and has the sides of the elytra less strongly rounded; the head and thorax are of a brilliant coppery crimson colour, or golden green, and the elytra are bright golden green; the antennæ have the first five joints red, the sixth pitchy red, and the rest black, the colour being less sharply defined than in *C. chloris*; legs red with the posterior femora dark; sometimes the legs are more or less pitchy; this variety appears to be the *C. nigricoxis*, All. L. 2-3 mm.

Marshy places, on willows, salallows, and poplars; locally abundant and generally distributed throughout England; according to Sharp, it is replaced in Scotland by *C. smaragdina*; Ireland, near Belfast.

C. smaragdina, Foudr. (*versicolor*, var., Kuts.; s.g. *Chalcoides*, Foudr.). Very closely allied to the preceding, of which it seems probable that it is only a variety; it may be known by its unicolorous brilliant green colour, and by having the interstices of the thorax, as well as those of the elytra, finely rugose; the antennæ and legs are entirely ferruginous, the posterior femora being sometimes darker at apex. L. 2-3 mm.

On aspens (*Populus tremula*); probably common and generally distributed throughout the kingdom, but overlooked and confused with the preceding species by collectors.

HIPPURIPHILA, Foudras.

This genus is separated from *Crepidodera* chiefly on the ground of its widely separated posterior coxæ, in which character it resembles *Epitrix*; the metasternum also, as in *Orestia*, is broadly produced between the middle coxæ, covering the mesosternum; the thorax is furnished at base with an indistinct transverse impression bounded on each side by a longitudinal impression; two European species are comprised in the genus, of which one is found in Britain.

H. Modeeri, L. Short oval, rather broad, convex, very shining, upper side æneous, with the apex of the elytra broadly testaceous, except at suture; head finely punctured, antennæ rather short and stout, testaceous at base, dark towards apex; thorax at base double as broad as long, subparallel till about middle, and thence rather strongly narrowed to apex, moderately thickly and finely, but distinctly punctured, basal transverse furrow indistinct with a small deep longitudinal

impression on each side ; elytra broader at base than thorax, produced into a common blunt point at apex, with shoulders strongly marked, punctuation in rather strong rows, which become obsolete towards apex, interstices broad, almost smooth ; legs stout, testaceous, posterior femora infusate ; the sculpture and general colour is somewhat variable. L. $1\frac{3}{4}$ – $2\frac{1}{4}$ mm.

Marshy places ; on *Equisetum arvense* ; local, but common where it occurs ; it appears to be widely distributed throughout England and Scotland, and probably also in Ireland. I used to take it abundantly at Repton, but only in one spot in a marshy place near some osier beds, and I never found a specimen elsewhere in the district.

EPITRIX, Foudras.

The members of this genus are easily distinguished from all the allied genera by having the elytra set with distinct rows of hairs ; the thorax as in *Crepidodera* is furnished with a transverse impression at base bounded on each side by a longitudinal impression or fovea ; the posterior coxæ as in the preceding genus are widely distant ; in the Munich catalogue published in 1876, twenty-six species are described as belonging to this genus, and in the supplement of M. Duvivier exactly this number are added ; with the exception of three from Europe and one from Jerusalem, they are all described from North Central and South America or adjacent islands ; a species has lately been brought before the Entomological Society (at the meeting held June 6th, 1888) as doing considerable damage to young egg-plants and tobacco-plants in the Island of Trinidad.

I. Upper surface unicolorous black ; average size larger . . . *E. PUBESCENS*, Koch.

II. Elytra black with two variable reddish-yellow spots on each ; average size smaller *E. ATROPÆ*, Foudr.

E. pubescens, Koch. Ovate or oblong-ovate, with the sides of the elytra subparallel towards base, convex, rather dull, black ; head finely punctured, antennæ testaceous at base, fuscous towards apex ; thorax short, very transverse, with a moderate transverse furrow at base bounded on each side by a deep fovea, thickly, distinctly, and deeply punctured ; elytra with shoulders slightly prominent, narrowed and obtusely rounded together at apex, with regular and rather strong rows of punctures, interstices furnished with very fine rows of punctures and of short but distinct ashy hairs ; legs testaceous, posterior femora and base of anterior and intermediate femora dark. L. $1\frac{1}{2}$ – $1\frac{3}{4}$ mm.

V. ferruginea. Upper surface entirely ferruginous, with the suture and extreme margins of elytra dark.

On *Solanum dulcamara* ; extremely local ; Shipley near Horsham, abundant (Gorham) ; Cowfold near Horsham, end of May 1873 (Power) ; Kent (J. J. Walker) ; Sheppey ; Whittlesea Mere. The variety is very rare, but Mr. Rye records two indigenous examples, without mentioning locality.

E. atropæ, Foudr. Smaller, shorter, and more ovate than the pre-

ceding, with the shoulders almost rounded, and the general punctuation considerably finer, the interstices on the elytra being evidently narrower, and the pubescence longer; it may be easily known by its colour, which is usually black with two rufo-testaceous spots on each elytron, one near the base, and the other at apex; these, however, are variable, and they occasionally meet and cover nearly all the elytron; sometimes the basal spot is absent. Allard considers that this species may be a variety of the preceding, but they are really very distinct. L. $1\frac{1}{3}$ – $1\frac{1}{2}$ mm.

Chalky places; on *Atropa belladonna*; very local, but in profusion where it occurs; Mickleham, Caterham, Headley Lane; Cotswold Hills (Blatch); Arundel Park, where I once found it abundantly on September 5th, 1879; Portsdown Hill, near Portsmouth (Moncreaff).

CHÆTOCNEMA, Stephens.

This genus, taken in its widest sense, as including *Plectroscelis*, Redt., contains about one hundred and forty-five species, of which more than half have been described since the publication of the Munich catalogue in 1876; they are widely distributed throughout the world, representatives occurring from Siberia to South Africa, and also in the Malay Peninsula and the Australian region, India, Central and South America, &c.; they are distinguished by the fact that the intermediate and posterior tibiae are furnished with a tooth on their outer side between middle and apex, or to describe it more accurately, are emarginate on their outer side before apex, both extremities of the emargination being raised into a tooth; twenty-four species are recorded as European, of which, however, ten belong to the genus *Plectroscelis*, which is here regarded as separate; the genus *Chætocnema* proper may be known by the large head, which has no elevated keel on forehead, the large labrum, and the more or less confusedly punctured elytra; there are five British species, which may be distinguished as follows:—

- I. Head behind eyes finely punctured; thorax thickly, finely, and not deeply punctured.
 - i. Form elongate oval; head closely punctured, duller.
 - 1. Upper surface always dark blue; average size smaller C. SUBCERULEA, Kuts.
 - 2. Upper surface bronze or greenish-bronze; average size larger C. ARIDULA, Gyll.
 - ii. Form short oval, rather broad; head diffusely punctured, at all events in centre, more shining . . . C. CONFUSA, Boh.
- II. Head behind eyes comparatively strongly punctured; thorax thickly and rather strongly and deeply punctured.
 - i. Antennæ with the base unicolorous red; colour bronze C. HORTENSIS, Fourc. (*aridella*, Payk.)
 - ii. Antennæ with the upper surface of the first joint and apex of the second dark; colour blue or bluish-green C. SAHLBERGI, Gyll.

C. subcœrulea, Kuts. (*Sahlbergii*, pars. auct.). Rather elongate, moderately convex, of a unicolorous deep dark blue colour or nigro-cœruleous; head broad, very closely and finely punctured, antennæ dark with the basal joints red, at all events on their under-side; thorax not strongly transverse, broadest in middle, finely and very closely, but distinctly punctured; wings present; elytra at base scarcely broader than thorax, rather strongly punctured in rows, which are irregular near suture towards base, but become regular at apex; legs ferruginous, more or less infusate, variable in colour, all the femora dark. L. $2-2\frac{1}{4}$ mm.

Marshy places, by sweeping herbage; also in moss and at the roots of grass; very local, but sometimes common where it occurs, although not always; Wimbledon, Weybridge, Ripley, Esher, Chobham, Balcombe, Cowfold; Windsor; Pegwell Bay; Dover; Hastings; St. Leonards Forest; Portsmouth district; New Forest; Sandown, Isle of Wight; it does not occur north of the London district.

This species has been much confused with *C. Sahlbergi*, which may be easily distinguished by its evidently more strongly punctured forehead; the general punctuation also is stronger, but this is not so apparent.

C. aridula, Gyll. Oblong-ovate, rather convex, æneous or nigro-æneous, moderately shining; head very finely punctured, antennæ black with the base red, the first joint dark on its upper surface, and the second, and sometimes the following, dark at apex; thorax about half as broad again as long, according to Allard much longer than in *C. aridella*, compressed in front, finely and thickly punctured; wings absent; elytra broader at base than thorax, punctured much as in the preceding species; femora dark, tibiæ and tarsi variable, ferruginous, more or less infusate. L. $2\frac{1}{4}-2\frac{1}{2}$ mm.

Damp places, by sweeping herbage; very rare; Woking (Champion); Loughton, Essex (Champion); Portsmouth district (Moncreaff); Strensall, York (Hey).

According to Allard, this species closely resembles *C. aridella* (*hortensis*), from which it is distinguished by its very finely punctured head and thorax, the longer thorax, and the fact that the base of the antennæ are spotted with black; the latter point has given rise to many mistakes, as all the species except *P. aridella* have the base of the antennæ in mature examples coloured in much the same fashion.

C. confusa, Boh. Allied to the preceding, but broader, and, as a rule, of a darker colour; the punctuation also is stronger, and that of the elytra more confused towards base; the punctuation of the forehead, at all events in the centre, is more diffuse and finer than in either of the preceding species; the upper surface is very shining; the thorax is broadest a little behind middle, and is finely and thickly punctured; the wings are rudimentary; the elytra are almost confusedly punctured on disc, the rows in front being scarcely traceable; the femora are dark,

and the tibiæ and tarsi clear testaceous-red ; the finely punctured head and thorax will easily separate it from *C. hortensis*. L. $2\frac{1}{4}$ – $2\frac{3}{4}$ mm.

Marshy places ; by sweeping herbage, and in moss ; very local, but occasionally not uncommon where it occurs ; Wimbledon, Esher, Tilgate ; Ashdown ; Shipley, near Horsham ; New Forest ; Quy Fen, Cambridge (one specimen only (Power)) ; Portland ; Manchester district (Chappell).

C. hortensis, Fourc. (*aridella*, Payk.). Oblong oval, moderately convex, of a coppery bronze colour, not very shining ; head with strong and very close punctuation, antennæ dark with the base clear red (a character that will distinguish it from mature specimens of all our other species) ; thorax short, in the male almost twice as broad as long, in the female about half as broad again as long, with sides slightly rounded and narrowed in front, very thickly and rather deeply punctured ; wings present ; elytra more shining than thorax, and distinctly broader at base, with rows of rather strong punctures, the central ones being more or less irregular and double towards base ; legs testaceous, with all the femora dark. L. 2 – $2\frac{3}{4}$ mm.

By sweeping herbage ; generally distributed and common in the London and South-eastern districts, and probably from the Midlands southwards ; it apparently becomes rarer further north, and is only recorded from one locality in the Northumberland and Durham district, viz. "Wooler Haugh, Mr. J. Hardy ;" Dr. Sharp only records it from the Moray district of Scotland, but is of the opinion that it probably occurs in several other localities. Ireland, near Dublin and Waterford.

C. Sahlbergi, Gyll., *nec* Wat. Cat. Oblong-ovate, convex, of a dark bluish or greenish-blue colour, sometimes cyaneous or violaceous, and occasionally æneous green ; it resembles *C. subcærulea*, from which it may easily be known by its more strongly punctured head and shorter and stouter antennæ ; antennæ dark with the base more or less red, the upper surface of the first joint and of the apex of the second, and sometimes of the following, being dark ; thorax convex, closely and strongly punctured ; elytra a little broader at base than thorax, with coarse rows of punctures, the central ones being more or less irregular and double towards base, interstices very finely alutaceous, shining ; legs somewhat variable in colour, femora all dark, tibiæ and tarsi ferruginous or testaceous, clear or more or less infusate. L. 2 – $2\frac{1}{2}$ mm.

On *Carex*, and occasionally on the Cranberry (*Vaccinium Oxycoccus*) ; very rare, and often represented in collections by *C. subcærulea* ; it has been taken by Dr. Power at Quy Fen, Cambridge, and by Mr. Wilkinson and Mr. Lawson near Scarborough, and I found one specimen of the æneous green variety at Westward Ho ! * N. Devon, at the end of August or beginning of September, 1883 ; it has also been recorded from Wimbledon, Blackdown (Devon), and the Bollin Valley, Cheshire, but I have not closely examined any of these specimens.

* Herr Reitter, to whom I submitted this specimen, is of opinion that it is a variety of *C. hortensis*, but the general form and appearance is certainly rather that of *C. Sahlbergi*, and the colour of the basal joints of the antennæ is also that of the latter species ; *C. hortensis* appears always to have the basal joints clear red.

PLECTROSCELIS, Redtenbacher.

Of the ten European species belonging to this genus, one only is found in Britain ; it is exceedingly common, and sometimes does considerable damage to certain crops, especially hops and turnips ; it is known, therefore, as the "hop-flea" in common with *Psylliodes attenuata*, and also as the "brassy" or "tooth-legged turnip beetle ;" it may easily be distinguished from the members of the preceding genus by its small head and labrum, and the elevated curved frontal keel and the regular rows of strong punctures on the elytra.

P. concinna, Marsh. (*dentipes*, Koch). Oval, moderately convex, shining, upper surface bright bronze, under-side black ; head small, triangular, very finely punctured, often almost smooth, antennæ reddish, darker towards apex ; thorax twice as broad as long, slightly narrowed in front, very thickly and rather finely, but distinctly punctured ; elytra broader at base than thorax, with strong and regular rows of deep punctures ; legs stout, ferruginous, with the posterior femora and more or less of the tibiæ and tarsi dark ; according to Weise, the females have the rows of punctures on elytra more regular and the punctures deeper, and the interstices obsoletely alutaceous ; in the male the interstices are finely punctured. L. $1\frac{1}{2}$ – $2\frac{1}{2}$ mm.

By sweeping herbage ; common and generally distributed throughout the kingdom ; it extends over Europe and Siberia.

PSYLLIODES, Latreille. (*Macrocnema*, Stephens.)

This very distinct genus may easily be known by the ten-jointed antennæ, and the fact that the posterior tarsi are inserted at some little distance from the apex of the tibiæ, which are compressed ; the anterior coxal cavities are closed behind ; the posterior femora are very strongly developed ; the thorax as a rule has no lateral fold or stria at base, but occasionally a short one is present, and the elytra are furnished with more or less distinct and strong rows of punctures ; in the male the first joint of the anterior tarsi is, as a rule, more or less dilated ; as at present constituted, the genus contains between eighty and ninety species, which are very widely distributed, representatives occurring in Asia, North America, Abyssinia, Sumatra, the Australian region, &c. ; nearly fifty of those at present known are found in Europe, of which fourteen inhabit Britain ; one of these, *P. attenuata*, Koch, sometimes does considerable damage to the hop-plant, and is known as the "hop-flea ;" the beetles get into the cones of the hops and deposit their eggs, and the larvæ when hatched burrow through the bracts of the cones, and make them lose colour and become disintegrated ; the chief damage, however, is done in early spring, when the hop-bines are just sprouting, by those beetles that have hybernated in the old hollow dead vines and other refuse ; it

is, therefore, most important that all rubbish should be removed and destroyed ; the quicker the vines grow, the less the injury that will be caused (as is the case with turnip crops when attacked by the turnip-fly), and therefore the addition of a little rich manure to the ground is very beneficial, as suggested by Miss Ormerod (Manual of Injurious Insects, p. 105); *P. attenuata* is, apparently, almost confined to the hop, and is therefore a very local species ; but the very abundant and more or less omnivorous species, *Plectroscelis concinna*, also in some seasons does great damage to the hop crop as before noticed.

The British species may be divided as follows:—

- I. Posterior tibiæ longer and more slender, almost straight on their under-side; posterior femora moderately broad.
 - i. Forehead with two distinct and deep furrows between eyes, which cross one another and form an X. *P. ATTENUATA, Koch.*
 - ii. Forehead with the furrows between the eyes absent or more or less obsolete.
 1. Under-side black or mostly black.
 - A. Sculpture of elytra stronger.
 - a. Length $3\frac{1}{2}$ –4 mm.
 - a*. Antennæ longer and thinner; colour variable, but upper surface usually bronze or bluish-green, except front of head which is reddish *P. CHRYSOCEPHALA, L.*
 - b*. Antennæ shorter and stouter; head and thorax always reddish-yellow, elytra blue *P. CYANOPTERA, Ill.*
 - b. Length 2– $2\frac{1}{2}$ mm.; head black, thorax and elytra, except suture, testaceous *P. AFFINIS, Payk.*
 - B. Sculpture of elytra finer.
 - a. Head and thorax brassy-green, elytra reddish-brown; size larger *P. LURIDIPENNIS, Kuts.*
 - b. Upper surface entirely bronze or blackish-bronze.
 - a*. Punctuation of thorax distinct and rather deep *P. CUPREA, Koch.*
(*cupronitens*, Först.)
 - b*. Punctuation of thorax very fine *P. INSTABILIS, Foudr.*
 - c. Upper surface blue or greenish-blue *P. NAPI, Koch.*
 2. Upper and under surface testaceous *P. MARCIDA, Ill.*
- II. Posterior tibiæ short, considerably arched on their under-side; posterior femora very broad.
 - i. Legs pitchy-black, posterior femora dark blue or violet *P. DULCAMARÆ, Koch.*
 - ii. Legs in part reddish or testaceous.
 1. Punctuation of thorax double, consisting of larger and smaller punctures; size larger.
 - A. Upper surface blue; rows of punctures on elytra finer *P. CHALCOMERA, Ill.*
 - B. Upper surface bronze; rows of punctures on elytra deeper *P. HYOSCYAMI, L.*
 2. Punctuation of thorax simple; size smaller.
 - A. Upper surface entirely reddish-testaceous *P. LUTEOLA, Müll.*
 - B. Upper surface dark bronze *P. PICINA, Marsh.*

***P. attenuata*, Koch.** Elongate-ovate, moderately convex, æneous

or greenish-æneous, elytra more or less distinctly rufescent at apex; head small, with two distinct furrows between eyes, which cross one another and form an X; antennæ ferruginous, darker towards apex; thorax not much broader than long, narrowed towards apex, thickly punctured; elytra about three times as long as broad, with rather strong and deep punctured striæ, interstices distinctly punctured, somewhat rugose; legs reddish-testaceous, posterior femora and base of anterior and intermediate femora dark. L. $2\frac{1}{3}$ – $2\frac{3}{4}$ mm.

On hops; also on low plants; locally common; Darenth, Dartford, Maidstone, Chatham, Sheerness, Whitstable; The Holt, Farnham; Hastings; Scotland, Inch-michael, Errol, Perthshire (Power); Ireland, near Waterford (Power).

P. chrysocephala, L. Oblong-ovate or elliptical, rather convex, of a greenish or bluish-green metallic colour; head more or less distinctly reddish or ferruginous, vertex dark, antennæ rather slender, reddish-testaceous at base, fuscous and slightly thickened towards apex; thorax broader than long, gradually and strongly narrowed in front, thickly and finely punctured; elytra broader at base than thorax, gradually widened for the anterior third, and thence narrowed to apex, with rather fine rows of punctures, and broad, even and plainly punctured interstices; legs variable in colour, but usually bright red with the posterior femora, and often the base of the intermediate and anterior femora dark; under-side black or pitchy black, breast and apex of abdomen often reddish. L. $3\frac{1}{2}$ – $4\frac{3}{4}$ mm.

V. anglica, F. (*Chrysomela nigricollis*, Marsh.). Elytra testaceous, thorax and apex of posterior femora nigro-æneous, head lighter; the rows of punctures on the elytra are said to be somewhat stronger, but this does not always appear to be the case; in the European catalogue of Heyden, Reitter, and Weise, this variety is regarded, as it used to be, as a separate species, but it does not appear to be really specifically distinct.

V. nucea, Ill. Entirely testaceous, with the posterior femora, breast and abdomen more or less infuscate.

On Cruciferae; especially on or near the coast; it is, however, also found far inland, and is not uncommon in some Midland localities; it appears to be generally distributed throughout the kingdom from the Orkney Islands southwards, and is sometimes very abundant; the varieties occur with the type, and the first mentioned is by no means uncommon.

P. cyanoptera, Ill. (*elongata*, Gyll.; *tripudians*, Kirby, MSS., Steph.). Elongate-elliptical, rather convex, head and thorax red, elytra cyaneous or greenish; antennæ comparatively short and stout, with the first two joints ferruginous, the two following pitchy, and the rest black; thorax more distinctly punctured than in the preceding species; elytra with strong rows of punctures; under-side of head and thorax red, of the rest of the body black; legs dark ferruginous, almost pitchy, lighter at the joints, posterior femora black. L. $3\frac{1}{2}$ –4 mm.

On Cruciferae; I have never seen a British example of this species, but Stephens records it as "taken near London, in Suffolk, and about Bristol."

P. luridipennis, Kuts. Oblong-ovate; head and thorax brassy green, elytra shining reddish-brown, antennae testaceous darker towards apex, hind femora brassy pale at the base; in the descriptions the legs are given as brassy green, but in the specimens I have seen they are of a clear reddish-testaceous colour, with the exception of the posterior femora; the species is of the size and build of *P. hyoscyami*, but is narrower; its smaller size, more brassy colouring, and more finely and closely punctured elytra will distinguish it from *P. chrysocephala*, of which insect, however, I cannot but think it is an extreme and local variety, which has been to a certain extent altered by its insular habitat. L. $3\frac{1}{2}$ –4 mm.

This species was discovered by Mr. Wollaston in Lundy Island, off the coast of Devon, and has never apparently occurred in any other locality.

P. napi, Koch, *nec* F. (*rapae*, Ill.). Oblong-ovate or elliptical, convex, under-side black, upper-side deep blue, head and thorax sometimes greenish; head small, antennae fuscous with base testaceous; thorax about half as broad again as long, narrowed towards the front, very finely punctured, often almost smooth on disc; elytra broader than thorax, with fine rows of punctures, interstices obsoletely punctured; legs reddish-testaceous, with the posterior femora nigro-æneous, and the tarsi more or less infusate. L. 2– $3\frac{1}{2}$ mm.

Damp places; on Cruciferae; more common in some districts than in others, but generally distributed throughout the kingdom.

P. cuprea, Koch (*cupronitens*, Först.; *herbacea*, Foudr.). Oblong-ovate, rather elongate, moderately convex, of a greenish-æneous or brassy colour, with a more or less distinct coppery reflection; head small, vertex distinctly punctured, front with a smooth triangular space between the antennae; thorax broader than long, narrowed in front, closely and rather distinctly punctured; elytra long, depressed on disc, with rather fine but distinct rows of punctures, interstices obsoletely punctured; legs reddish-testaceous, posterior femora nigro-æneous, anterior and intermediate femora often infusate at base. L. $2\frac{1}{2}$ –3 mm.

On low plants, especially Cruciferae; sometimes on poppies; not uncommon and generally distributed throughout the greater part of the kingdom.

P. instabilis, Foudr. (*picipes*, W. C., *nec* Redt.). Very like the preceding, but rather smaller, broader and darker, with the head and thorax more diffusely and finely punctured and more shining, and the striae of the elytra finer and almost effaced behind; the interstices of the latter are finely rugose and rather dull; the legs are stouter than in *P. cuprea*, and have the anterior and intermediate femora more often infusate. L. $2\frac{1}{2}$ – $2\frac{3}{4}$ mm.

On *Erysimum*, *Sinapi*, and other Cruciferæ; very rare; Mickleham (Rye), one specimen; Mr. Saunders has one or two specimens without locality from Mr. Crotch's collection; there is an old specimen without locality in Dr. Power's collection; Mr. Rye gives the following note on the species in the Entomologists' Annual for 1869, p. 61: "The *P. picipes* of Mr. Waterhouse's catalogue (a single specimen), long suspected to be not identical with *picipes*, Redt., has been returned as *P. instabilis* by Herr Kutschera. I am quite unable, beyond a slight colour difference, to separate this specimen from that hitherto representing *picipes* in my own collection, and which, from possessing intermediate links, I think is only a variety of that common insect now called *herbacea* by Allard, but *cuprea* by Kutschera." My single specimen, given me by Mr. E. Saunders, seems distinct, but, as Mr. Rye observes, *P. cuprea* is very variable, and it is doubtful if all the allied European species are really distinct.

P. affinis, Payk. (*exoleta*, Ill.; *atricilla*, Panz.). Oblong-ovate, moderately convex, head black, thorax reddish-testaceous, elytra testaceous with suture dark, metasternum and abdomen black; head almost impunctate, antennæ entirely testaceous; thorax in the male about half as broad again as long, in the female nearly twice as broad as long, with sides somewhat callose at anterior angles, more or less thickly and rather finely punctured; elytra broadest just behind shoulders, with rows of rather strong and deep punctures, which become much finer towards apex, interstices very finely punctured; legs testaceous, posterior femora dark, somewhat angularly dilated on their inferior margin. L. $2\frac{1}{4}$ – $2\frac{3}{4}$ mm.

On *Solanum dulcamara* and other Solanaceæ; somewhat local, but common where it occurs, and generally distributed in England and Ireland; it is not recorded from Scotland, although Bold mentions it as "local, but abundant where found" in the Northumberland and Durham district.

P. marcida, Ill. (*operosa*, Foudr.; *pallidipennis*, Ros.). Oblong-ovate, moderately convex, entirely testaceous, with the elytra often lighter than the head and thorax; the upper surface usually presents an æneous reflection, and the head and more or less of the under-side are sometimes pitchy; the posterior femora are marked with an indistinct dark spot at apex, and occasionally are altogether pitchy; head closely and strongly punctured, antennæ sometimes slightly brownish towards apex; thorax convex, transverse, narrowed in front, thickly and strongly punctured, the punctuation being rugose at the sides; elytra depressed on disc, with rather fine and closely punctured striæ, interstices broad, very finely punctured, lateral margin furnished with short cilia. L. 3–4 mm.

Sandy coasts; on *Crambe maritima*, *Cakile maritima*, and *Cochlearia officinalis*; local; London district, rare, Sheerness; Southend; Walton-on-Naze; Harwich; Lowestoft; Camber sand hills, Hastings; Southsea; Dorset; Scilly Islands (J. J. Walker); Tenby; Barmouth; Hunstanton; Mablethorpe, Lincolnshire; Spurn Point; Scarborough; Wallasey, Cheshire; Holy Island; Northumberland and Durham district, abundant; Scotland, Tweed and Forth districts; Ireland, Portmarnock.

P. dulcamaræ, Koch. A rather short and broad species, ovate, convex, of a nigro-cœruleous or cyaneous colour, antennæ black with

base testaceous, legs pitchy with the posterior femora cyaneous; head finely punctured, antennæ comparatively short and stout; thorax twice as broad as long, narrowed in front, finely punctured, the punctuation consisting of larger and smaller punctures intermingled; elytra with moderate rows of punctures, interstices finely, but distinctly, punctured; in this and all the following species the posterior tibiæ are short and considerably arched on their under-side, and the posterior femora are very broad. L. $3-3\frac{1}{2}$ mm.

Chalky places; on *Solanum dulcamara*; local, but not uncommon where it occurs; Darenth, Esher, Croydon, Caterham, Mickleham, Westerham, Maidstone, Dartford, Chatham; Hastings; Hayling Island; New Forest; Glanvilles Wootton; Horning Fen, Norfolk; Wicken Fen, Cambridge; Ireland, near Waterford (Power).

P. chalcomera, Ill. (*hyoscyami* var., Weise). Oblong-ovate, subelliptical, of a deep blue colour above, antennæ pitchy black, with the base reddish-testaceous; legs red or ferruginous with the posterior femora nigro-æneous; thorax with double punctuation; elytra with rather strong rows of punctures, interstices finely but distinctly punctured and somewhat rugose; from the preceding species it may easily be known by its red legs, and from *P. napi* by its larger size and stronger sculpture; it is considered by Weise (l.c. p. 821) to be merely a variety of *P. hyoscyami*, and it certainly only differs from that species in a few slight particulars. L. 3-4 mm.

On *Carduus nutans* and *Circea*, also on *Nasturtium officinale*; local; London district, not uncommon and widely distributed; Hastings; Folkestone; Eastbourne; Brighton; Hunstanton, Norfolk; Yorkshire; Scotland, Tweed and Forth districts; it probably occurs in many intervening localities; Ireland, Armagh.

P. hyoscyami, L. Very like the preceding, but of a bronze-green or slightly coppery colour; under-side nigro-æneous; antennæ black with base reddish-yellow; legs reddish-yellow with posterior femora dark; thorax with the punctures smaller but thicker and closer than in *P. chalcomera*; the punctured striæ of the elytra are also, as a rule, but apparently not always, deeper. L. 3-4 mm.

On *Hyoscyamus niger* (Common Henbane); very rare as a rule, although occasionally found in some numbers; Shirley, near Croydon (Rye); Merton, Surrey (Power); Manchester district, in some numbers (B. Cooke); Scotland, Forth district, "Dalmeny, Mr. Greville," Murray's Cat.; Ireland, Firhouse near Dublin.

P. luteola, Müller (*propinquus*, Redt.; *pallida*, Steph.). Elongate ovate, entirely testaceous or ferrugino-testaceous, with the labrum, the antennæ towards apex, the breast and abdomen, and the posterior femora in part, ferruginous or infusate; head obsoletely punctured; thorax transverse, rather thickly and very finely punctured; elytra comparatively narrow, depressed on disc, with regular rows of distinct but comparatively fine punctures, which are less pronounced at apex; the species somewhat resembles *P. affinis*, but may at once be known by its narrow and more elongate form, testaceous head and generally lighter colour, and the much finer punctuation. L. $2\frac{1}{2}-2\frac{3}{4}$ mm.

On potato-flowers and various species of *Solanaceæ*; one of our rarest species; some years ago the Rev. A. Matthews obtained several specimens by sweeping in Sherwood Forest; it is recorded by Stephens as "found near London and at South-end by Mr. Waterhouse;" in Dr. Power's collection there are two specimens, one from Mr. Crotch, and the other from the Rev. Hamlet Clark.

P. picina, Marsh. (*picea*, Redt.). Oblong-ovate, subelliptical, nigro-piceous, usually with a more or less distinct æneous reflection; head smooth on vertex, forehead with a depression between eyes, antennæ rather short and stout, ferruginous, usually darker towards apex; thorax transverse, but not strongly so, convex, rather thickly and very finely punctured; elytra considerably broader than thorax, widened to middle and thence gradually narrowed to apex, with moderately strong rows of punctures which become feebler behind, interstices obsoletely punctured; legs ferruginous, with the posterior femora more or less nigro-piceous or bronze-black. L. $2\frac{1}{2}$ –3 mm.

Damp places; on *Lythrum salicaria*, also on *Cirsium palustre*; not common, but widely distributed; Norwood; Snodland (Kent); West Wickham; Birdbrook; Amberley, near Arundel; Henley; Norfolk; Bungay and Ditchingham, Suffolk; Wicken Fen and Littleington, Cambridge; Swansea; Robins Wood, Repton; Lincoln; Yorkshire; Bowdon and Stretford, near Manchester; Liverpool district; Northumberland and Durham district, rare; Scotland, Solway, Tweed, and Forth districts; Ireland, Armagh, rare (Johnson); the species appears to be much rarer in the south than further north; it is somewhat an exception to the usual rule of the Halticidæ, for it is often found by single specimens.

CRYPTOSTOMATA. (*Fronticornia*, Thoms.)

The members of this group are distinguished by having the front strongly inflexed, so that the mouth is confined to the under part of the head; the antennæ are approximate at base and inserted high on the forehead between the eyes, and are more or less thickened towards apex; the anterior coxal cavities are closed behind, and the anterior coxæ are transverse and not prominent; the posterior femora do not pass beyond the margin of the elytra, which often conceal almost the whole of the legs; there are no tibial spurs, and the last joint of the tarsi is contained within the lobes of the third joint, the claws alone projecting; two tribes only are contained in the group, the Hispina and the Cassidina; the former of these is not represented in Britain (although *Hispa atra* has been erroneously stated to have occurred), and only two genera (*Hispa*, L., and *Leptispa*, Baly) represented by three species have been found in Europe; the tribe, or family, as it is considered by many authors, is, however, largely represented in the tropics; about sixty genera and several hundred species are enumerated in the Munich catalogue, and a considerable number of species have been added since its publication through the researches of Mr. Champion in Central America; the chief difference between the Hispina and the Cassidina lies in their shape, the members of the former being wedge-shaped,

narrowed in front and widened behind, with the margins of the thorax and elytra not explanate, whereas in the latter the shape is round or oval and very convex, with the margins of the thorax and elytra much widened and extended to a considerable distance beyond the body; the head, moreover, is free in the Hispina, whereas in the Cassidina it is, as a rule, entirely hidden by the thorax; the larvæ of both tribes protect themselves with a covering formed of their own excrement; some of the species of the Hispina are large and conspicuous insects (e.g. *Alurnus*), and many are brightly coloured; a considerable number are closely set with upright spines or bristles, from which the genus *Hispa* derives its name; *H. atra*, which has been mentioned above as having been recorded in error as British, has occurred in the Scandinavian region, and may possibly be confirmed as indigenous; it is a small dull black species ($2\frac{1}{2}$ –3 mm. in length), of an oblong shape, which may easily be recognized by the large and stout oblong spines which cover its upper surface.

CASSIDINA.

According to the Munich catalogue published in 1876, this tribe contains thirty-nine genera and a large number of species, the three genera, *Mesomphalia*, Hope (*Cyrtonota*, Chevr.), *Cassida*, L., and *Coptocycla*, Boh., comprising upwards of one thousand between them; the chief characteristic of the tribe is found in the fact that the thorax and elytra have the margins much expanded, so that the under-side of the body is completely covered as though by a shield; the legs also are short and retractile, and the head in most species is quite concealed beneath the anterior margin of the thorax; from these peculiarities, as well as from the general shape, the species have received the common name of "Tortoise-beetles;" some of the exotic species are among the most brilliantly coloured of all the Coleoptera, but in most cases the colour very rapidly fades, and turns to a dingy brown; if the insects are comparatively fresh, immersion in glycerine or spirits of wine will partially restore the colour for a time, as I have found by experience in the case of species received from my brother, Rev. F. H. Fowler, when in Assam; two of our British species, *C. nobilis*, L., and *C. vittata*, Vill. (*oblonga*, Ill.), are furnished with brilliant longitudinal sutural bands, which very quickly fade; no one who has seen them in life could recognize them in the dingy-looking insects that stand under their names in our collections; the forms, as well as the colours, of the exotic species are very striking, some of them being provided with a long upright pointed horn which rises from the centre of their backs. The larvæ, as above mentioned, protect themselves with a covering formed from their own excrement, which, according to Westwood, they bear over their backs by the assistance of an elongated forked appendage arising from the extremity of the body, and bent forwards, reaching

nearly to the head; a full description will be found given by Chapuis et Candèze (Catalogue des Larves des Coléoptères, p. 259); the larva and pupa of either *C. viridis* or *equestris* are figured by Westwood (Classification, i. p. 377, fig. 46, 9, 10, 11); the former is broad and flattened, with the margins of the segments furnished with long and setose spines, eight arising from the prothorax, four from both the meso- and metathorax, and two from each of the abdominal segments; the extremity of the body is slightly recurved, and the elongate fork above referred to as bearing the excrement arises rather above the anal aperture; the pupa is flat, and furnished with tooth-like serrated appendages, arising on each side of several of the abdominal segments; the prothorax also is greatly dilated, entirely covering the head, and is also furnished with setose spines (*v.* Westwood, l. c. p. 378).

The genera are almost entirely tropical, and only one, *Cassida*, is represented in Europe.

CASSIDA, Linné.

Of the forty-nine European species belonging to this genus, thirteen occur in Britain; the genus, as a whole, contains upwards of three hundred species, which are very widely distributed from Siberia to Madagascar and the Australian region, the majority, however, being found in tropical countries; the genus is characterized by having the head hidden under the thorax, with the eyes oval and not prominent, the antennæ shorter than half the body, thickened towards apex, and the elytra usually punctured in striæ or rows; the prosternum has a short process behind the coxæ, which is received in a fovea of the mesosternum; the body is suborbicular or oval, and the thorax is usually semicircular; owing to the great change of colour after death, the species are in some cases very like each other in general appearance as seen in collections, although in life they appear very different; this is, however, the case with only two or three British species, which may be distinguished by other differences; I have, therefore, preferred to adopt the general colour distinction as the basis of the following table, as it is much more obvious than the characters drawn by Thomson and others from the direction of the frontal lines, the colour of the head (which is always hidden or nearly hidden), the ocellate punctuation of the elytra, &c.:—

I. Elytra with well-marked rows of punctures, which are very rarely irregular.

i. Elytra with black spots or markings on disc.

1. Rows of punctures on elytra fine; interstices broad, flat.

A. Form larger and rounder; thorax shorter, finely but roughly punctured, dull; elytra without a continuous longitudinal black sutural band

C MURRÆA, L.

- B. Form smaller and more oblong; thorax longer, very finely punctured and rather shining on disc, coarsely punctured at sides; elytra with the suture broadly black C. FASTUOSA, Schall.
(vittata, F.)
2. Rows of punctures on elytra coarse; interstices narrow, strongly raised C. NEBULOSA, L.
- ii. Elytra without black spots or markings on disc, but with the suture, or at least its base, not unicolorous with the rest of the upper surface.
1. Suture of elytra broadly pitchy brown or blackish; size larger C. VIBEX, F.
2. Suture of elytra, or at least base, reddish-brown or sanguineous.
- A. Form shorter and less parallel; sculpture finer; suture of elytra, or at least base, sanguineous without metallic spots. C. SANGUINOLENTA, F.*
- B. Form longer and more parallel; sculpture coarser; base only of elytra reddish-brown with metallic specks (only visible in life) C. CHLORIS, Suffr.
3. Suture of elytra with a broad metallic longitudinal band.
- A. Posterior angles of thorax obtuse, but well marked; form more elongate . . . C. VITTATA, Vill., nec F.
(oblonga, Ill.)
- B. Posterior angles of thorax completely rounded; form shorter C. NOBILIS, L.
- iii. Upper surface unicolorous.
1. Upper surface ferruginous; elytra with irregular rows of punctures C. SUBFERRUGINEA, Schrank.
(ferruginea, F.)
2. Upper surface yellowish, yellowish-green, or bright green; elytra with regular rows of deep punctures C. FLAVEOLA, Thunb.
(obsoleta, Ill.)
- II. Elytra irregularly punctured throughout, or with rows of punctures traceable at suture and shoulders only.
- i. Posterior angles of thorax completely rounded; size large C. EQUESTRIS, F.
- ii. Posterior angles of thorax very obtuse, but marked.
1. Form broad oval; abdomen black; size moderate C. VIRIDIS, F.
2. Form subhemispherical; abdomen yellow; size small C. HEMISPHERICA, Herbst.
- C. murræa**, L. (*maculata*, L.). Oval or round-oval, upper-side evenly convex, green or ferruginous-brown with the elytra marked with black spots and patches; head, under-side and legs black, antennæ

* Occasionally examples of this species occur which are unicolorous green or almost unicolorous (see p. 399).

black, with base lighter; thorax semicircular, with posterior angles right angles, base gently sinuate; elytra with regular rows of rather fine punctures, interstices broad and even, suture often almost entirely black, the colour, however, being always interrupted. L. 5–7 mm.

On *Inula dysenterica* (Fleabane), and *Mentha*; very local and scarce; Greenwich (Stephens); Plaistow Marshes; Cambridgeshire; Dover; near Sandwich; Holm Bush, Brighton (Power); Portsmouth district (Moncreaff); Glanvilles Wootton, on horse mint (Dale); Newton, Devon, scarce; Braunton Burrows, N. Devon (Blandford).

C. fastuosa, Schall. (*vittata*, F., *nec* Vill.). Oblong-ovate, ferruginous; antennæ dark towards apex, reddish at base; thorax rather long, distinctly punctured at sides, almost smooth and somewhat shining in middle, with black spots at posterior angles and on front margin and disc, posterior angles marked, base sinuate; elytra with the suture broadly, and irregular patches on each, black, with fine rows of punctures, interstices broad and even; legs black. L. 4–5 mm.

On *Senecio jacobæa*, very local and rare; Godstone, Surrey (Stephens); Greenhithe, Kent; Chatham, where a few specimens have been taken from moss in a wood in winter by Mr. Champion and Mr. J. J. Walker; Berks, Windsor, Rye, and New Forest (Stephens); Pepperering Powder-mill Ponds, Hastings (Butler); Glanvilles Wootton, one specimen, October 1st, 1877, on mint (Dale); Manchester (Chappell).

C. nebulosa, L. Oval, moderately convex, upper surface rust-brown or greenish with small black spots dotted over the elytra, under-side black with the margins of abdomen testaceous; front of head pale, antennæ dark, reddish at base; thorax semicircular, with the posterior angles rounded, shallowly and moderately distinctly punctured, sinuate at base; elytra with regular rows of coarse punctures, interstices strongly raised; legs, except femora, testaceous. L. 5–6 mm.

Male more ovate, with the yellowish border of the abdomen narrower, and the femora almost entirely black.

Female with the yellowish border of the abdomen broader, and the femora black with a yellowish central line.

On clover, beetroot, and other low plants; rare; Horsell (Power); Darenth Wood, Monks Wood, and Bottisham near Cambridge (Stephens); Whittlesea Mere (Blatch); Nocton, near Lincoln (Waterhouse).

C. vibex, F. (*liriophora*, Kirby; *dorsalis*, Herbst.). Broad oval, upper surface green, elytra with the suture broadly pitchy brown or blackish, under-side black; antennæ dark, with base pale; thorax almost semicircular, with the posterior angles marked, subrugosely punctured, less closely on disc than at sides; elytra with regular rows of rather coarse punctures, interstices narrow, the second being somewhat strongly raised; legs reddish-testaceous, femora almost entirely black. L. 5–6 mm.

By sweeping thistles, *Centaurea*, *Serratula arvensis*, &c.; local, but not uncommon where it occurs; Caterham, Mickleham, Ashted, Darenth Wood, Tonbridge, Faversham, Whitstable, Chatham, Horsell, Birch Wood, Belvedere;

Hertford; Ditchingham, Suffolk; Wicken Fen; Shipley, near Horsham; Hastings; Holm Bush, Brighton; New Forest; Glanvilles Wootton; Branton Burrows, N. Devon; Bristol; Filey, Yorks (one specimen taken by myself on a thistle on the cliffs); Liverpool district.

C. sanguinolenta, F. Short oval, subrotundate, very convex, shining, upper surface of a more or less bright green colour, with the suture of the elytra, or at least its base, sanguineous, under-side black with the border of the abdomen pale; antennæ reddish, darker towards apex; thorax almost semicircular with the disc finely and regularly punctured, the punctures being stronger at sides, posterior angles well marked; elytra with regular rows of rather deep punctures, compressed at sides, with some of the interstices slightly raised; legs pale. L. $3\frac{1}{4}$ –4 mm.

A variety of this species occurs in which the elytra are unicolorous; this cannot well be confused with any other species except *C. hemisphærica*, from which the regular rows of punctures on the elytra, and the colour of the abdomen will at once separate it.

On thistles and *Achillea millefolium*, also apparently on other low plants; not common; Hammersmith, Forest Hill, Highgate, Horsell, Cowley, Southend, Epping, Chatham; Wicken Fen; Cambridge; Deal; Dover; Folkestone; Portsmouth district; Glanvilles Wootton; Swansea; Salford Priors; Bewdley Forest; Repton; Aigburth clay banks and Wallasey, near Liverpool; Northumberland and Durham district, very rare; the variety has occurred at Bushey, Deal, &c.

C. chloris, Suffr. This species was considered exceedingly doubtful as British, until the Rev. H. S. Gorham confirmed it on the authority of specimens taken by himself; according to his note in the Entomologists' Monthly Magazine, vol. xxii. p. 14, it cannot be compared with any species in the British list, except *C. sanguinolenta*; from this species it may be easily separated by its longer and more parallel build, coarser sculpture, and different colour; in fact, it appears only to resemble it in having a reddish base to the elytra, which part, however, is not sanguineous, but reddish-brown; its general colour in life is green, and on the reddish-brown part several golden specks may be seen in life; the thorax and elytra are rather coarsely punctured, and on the latter the punctures are in irregular and somewhat interrupted series, becoming confused towards the apex; the legs are yellow; the body, head, coxæ, and thickened part of the antennæ are black. L. $3\frac{1}{4}$ –4 mm.

Very rare; two specimens taken at Shipley near Horsham out of flood-rubbish from the river Adur, and one at Twyford near Winchester by the Rev. H. S. Gorham; Scotland, very rare, Solway district, Dumfriesshire (Sharp and Lennon).

C. vittata, Vill., nec F. (*oblonga*, Ill.). Elongate oval, somewhat elliptical, upper-side greenish, elytra with a common greenish-golden metallic stripe at suture, the centre of which is often reddish, under-side black, margins of abdomen broadly greenish; antennæ fuscous with base light; thorax semicircular, very finely punctured, with posterior angles well marked; elytra rather long, somewhat narrowed towards apex,

with regular rows of rather strong punctures; legs greenish-testaceous. L. $4\frac{1}{2}$ – $5\frac{1}{2}$ mm.

On *Salicornia* and other salt-marsh plants, sometimes also found by pulling up the roots; almost always found on or near the coast; locally common; Chatham, Sheerness, Gravesend, Southend, Rochester; Portsmouth district; Bournemouth; Lymington Salterns; Exmouth and Barnstaple; Bristol; Swansea; Stourport; it has also been recorded from Coombe Wood, Fakenham, Ripley (Surrey), and Henley, but these records may be in error, as the species seems almost entirely confined to salt marshes.

C. nobilis, L. Allied to the preceding, but easily distinguished by its broader-ovate form, and by having the posterior angles of the thorax rounded; upper surface pale greenish-yellow, under-side black with the margins of the abdomen light; antennæ dark with base reddish; thorax semicircular, punctured at sides, and nearly smooth on disc, which is raised; elytra with rows of deep punctures, and with a common metallic sutural band which is variable in colour, being sometimes silvery bluish, sometimes coppery, and sometimes purple or reddish; the metallic colour seems generally to be confined to the second interstice, the suture itself being greenish or fuscous; occasionally striæ of the metallic colour are visible on the disc of the elytra; legs yellowish, base of femora, and rarely the entire femora, black. L. 4–5 mm.

Chalky and sandy places; on low plants; occasionally found in moss; local, but not uncommon in some districts; Hounslow, Caterham, Chobham, Shirley, Ockham (Surrey), Walton, Forest Hill, Cowley, Gravesend, Southend, Faversham, Chatham, Sheerness; Harwich; Margate; St. Peter's; Deal; Folkestone; Dover; Sandwich; Hastings; Southsea; New Forest; Southampton; Portland; Dawlish, Devon (on *Salicornia*); Swansea; Cambridge; Wicken Fen; Whittlesea Mere; Yorkshire; Ireland, Carlingford and Greenore-on-shore on *Honckenya peploides* (Johnson).

C. subferruginea, Schrank. (*ferruginea*, F.). Oval, upper surface ferruginous, sometimes with a feeble metallic reflection, under-side black; antennæ pale, fuscous towards apex; thorax distinctly punctured, with posterior angles rounded; elytra with irregular rows of punctures, alternate interstices raised; legs red, with the base of the femora infusate; the abdomen appears to be occasionally more or less ferruginous. L. 4–5 mm.

On *Achillea millefolium* and other low plants; very rare, and somewhat doubtfully indigenous; recorded by Stephens from Devonshire, and by Dillwyn from near Swansea.

C. flaveola, Thunb. (*obsoleta*, Ill.). Ovate, upper surface of a dirty yellowish or pale greenish yellow colour, under-side black, abdomen usually with a yellowish border; front pale, antennæ testaceous, fuscous towards apex; thorax smooth or very finely punctured on disc, more coarsely at sides, with a depression before scutellum, and with the posterior angles rounded; elytra with regular rows of strong punctures; legs testaceous. L. $3\frac{1}{2}$ – $4\frac{1}{2}$ mm.

In rare cases the thorax has a fuscous spot behind, and the elytra are slightly infusate towards base.

On Starwort and other low plants; occasionally found in moss, decaying seaweed, &c.; local, but generally distributed throughout the greater part of England and Wales, and, as a rule, common; Northumberland and Durham district, not common (Bold); Scotland, common, Solway, Tweed, Forth, Clyde, and probably other districts; Ireland, near Waterford and Armagh, and probably widely distributed.

C. equestris, F. (*viridis*, L., nec F., teste H. R. W.). A large and conspicuous species, with the upper surface green and the under-side black, the margins of the abdomen being reddish-yellow; antennæ red for half their length, and the rest black; thorax sublunate, very finely punctured on disc, more strongly at sides, with posterior angles rounded; elytra raised towards base, sloped towards apex, confusedly, subrugosely, and moderately strongly punctured; legs entirely reddish-testaceous. L. 7-9 mm.

Marshy places; on species of *Mentha*; local, but not uncommon in many districts; Colney Hatch, Woking, Maidstone, Tottenham, Merton Marsh, Balcombe, &c.; Wicken Fen; Soham; Ely; Dover; Hastings; New Forest; Winchester; Glanvilles Wootton; Swansea; Barmouth; Gloucester; Bretby Park; Repton; Yorkshire; Lancaster; Northumberland and Durham district; Scotland, rare, Solway, Forth, and Tay districts; Ireland, near Armagh, and probably generally distributed.

C. viridis, F. (*rubiginosa*, Müll.; *singularis*, Steph.). Allied to the preceding, but smaller, more oblong, and more evenly convex; it may, moreover, be easily distinguished by having the posterior angles of the thorax obtuse, but marked, and the almost entirely black femora; upper surface bright green, under-side black, abdomen with only the extreme border lighter; antennæ reddish, fuscous towards apex; thorax sublunate, rugosely punctured, more coarsely at sides than on disc; elytra confusedly punctured on disc, with more or less distinct rows of punctures at suture and shoulders, usually reddish-brown at base; legs, except femora, reddish-testaceous. L. $5\frac{1}{2}$ -7 mm.

On thistles; generally distributed and common throughout the greater part of the kingdom.

C. hemisphærica, Herbst. (*concinna*, Steph.; *anglica*, Curt.). Round, subhemispherical, very convex, upper surface green or yellowish-green, under-side black with the abdomen entirely yellowish (a character that will at once distinguish the species); antennæ testaceous, slightly darker towards apex; thorax sublunate, very finely punctured on disc, more distinctly at sides, posterior angles marked; elytra deeply and confusedly punctured, with a row of strong punctures towards margins, interstices smooth and shining, suture somewhat raised at anterior third; legs yellow. L. 3-4 mm.

On *Silene inflata* and other low plants; rare, and usually occurring by single specimens; Lee, Surrey (West); Caterham, Mickleham, and Deal (Champion); Suffolk; Weybridge; Birch Wood; Wicken Fen; Hastings district, several localities (Butler, Power, and others); Glanvilles Wootton (Dale); Powderham Park, Devon, on salt-marsh plants (Parfitt); Braunton Burrows (Blandford); Barmouth (Blatch); near Burton-on-Trent (Harris); Tenby, S. Wales, and Filey, Yorks (one specimen taken in each place by myself); Scotland, very rare, Solway district (Sharp).

There is considerable confusion with regard to the nomenclature of this genus; the insects commonly regarded by British collectors as *C. vibex*, *C. viridis*, and *C. equestris* are respectively named in the European catalogue of Heyden, Reitter, and Weise as *C. liriophora*, Kirby, *C. vibex*, L., and *C. viridis*, L.; I have preferred to retain our commonly received names, as it does not appear quite certain which are really the Linnean species in every case, and *C. viridis* and *C. equestris* are apparently confused by some authors; at all events it would be far better to substitute entirely new names than to cause inextricable confusion by a general intermixture.



Cardiophorus equiseti, Herbst., Er., *nec* Steph. Black, densely and finely punctured all over, clothed with close ashy-grey pubescence, without fulvous tinge; narrower and more parallel than *C. asellus*. Thorax convex, slightly longer than broad, with sides moderately rounded, nearly straight for anterior third, more contracted at base than in *C. asellus*, with central furrow distinct behind and two short lateral sulci at base. Elytra much wider than thorax at base and two and a half times as long, with sides nearly parallel for anterior half, slightly contracted behind shoulders and dilated at middle and thence gradually narrowed to apex, flattened along suture, with punctured striæ, interstices convex at base; antennæ and palpi black; legs black with knees slightly pitchy and tarsi reddish; all the tarsal claws dentate; apex of last two abdominal segments pitchy. L. $7\frac{1}{2}$ mm.

A single specimen was taken by Miss E. A. L. Daltry in long grass on the cliff between Tenby and Manorbier, South Wales, on May 29th, 1889, and was sent by her to Mr. W. Blandford, for whom it was determined by Mr. Champion; I am indebted to Mr. Blandford for the above description. It is not certain whether we do not possess *C. cinereus*, Herbst., as British; like *C. equiseti*, it has the tarsal claws dentate, a point that will separate both the last-mentioned species from the closely allied *C. asellus*; it is, however, broader and less cylindrical than *C. equiseti*, and the pubescence is somewhat different; according to Kiesenwetter the colour of the legs is much as in the above description of *C. equiseti*, whereas *C. equiseti* has the legs red; there are specimens in the collections of Stephens and Leech, without localities, that may, perhaps, turn out to be representatives of both these very nearly allied species.



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